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INFECTIOUS LYMPHOCYTOSIS

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REVIEW OF THE LITERATURE

A condition in which there is marked total kocytosis with high relative lymphocytosis without clinical signs or symptoms has so as we know been reported in the literature y 4 times previously. Three of these reports re of children, while 1 was of an adult.

In February 1941, Reyersbach and Lenert [1] orted under the title "Infectious Mononuosis Without Clinical Signs or Symptoms" 16 es occurring in a sanatorium for children who had had rheumatic fever. They were thought to atypical cases of infectious mononucleosis, alough they did not have any of its characterics except lymphocytosis. The ages of the ldren varied from 6½ to 12 years. The leukote counts ranged from 18,400 to 59,300, with m 71 to 93 per cent of the cells lymphocytes. e Paul-Bunnell test, which is based on the fact t blood serum of patients with infectious nonucleosis clumps red cells of sheep in utions above the normal titer and which has en considered diagnostic of this disease, gave iformly negative results. These authors also ed the case reported by Wilson and Cunningm [2] in 1929, of an adult aged 20 years, as the nly clearcut case" of marked leukocytosis thout clinical signs or symptoms which had en reported previously.

Smith [3] in August 1941 reported 2 more cases high leukocytosis, with 44,900 and 98,000 as e maximum leukocyte counts and with mphocytes 79 and 86 per cent respectively. he patients were children without clinical signs symptoms, and the disease had the same aracteristics as in the preceding cases. Smith inted out that the disease described in the 2 evious reports was likely not infectious mononucleosis at all, but was exactly similar to the disease in his 2 cases, which he termed "infectious lymphocytosis."

The fourth report, by Duncan,[4] in September 1943, was of a child 4 years and 11 months old, with acute abdominal symptoms, headache, fever and a leukocyte count of 45,000 discovered at the onset. The maximum leukocyte count was 110,000, with 95 per cent of the cells lymphocytes. The differential cell count was similar to all of the preceding ones reported, the duration about five weeks and the reaction to the Paul-Bunnell test negative. This case differed from all of the others in the occurrence of acute symptoms at the onset.

REPORT OF CASES

It has been thought worth while to make the following report of an epidemic of 21 cases occurring in the children's wards of Glenn Dale Sanatorium, the tuberculosis sanatorium of the District of Columbia, during the winter of 1942-1943.

It is well known that pronounced total lymphocytosis is found in children with pertussis or with lymphatic leukemia, moderate lymphocytosis in children with infectious mononucleosis and only slight total or relative lymphocytosis in children with tuberculosis and with postinfectious conditions.

CASES 1 and 2.—The first of our patients, R. C., was a white boy aged 3 years, who had only a slight primary infection tuberculosis and was doing well. The leukocytosis was discovered on Nov. 25, 1942, while routine complete blood counts were being done on the children after a six month interval. Several other boys in the same room as this child had normal counts on the same day. Four of the blood counts for this patient follow, showing the pictures six months previously, five days after the first high count and (the maximum count) seventeen days after the first high count:

May 19, 1942: Erythrocytes 4,200,000, hemoglobin 63 per cent, or 10.5 Gm. per hundred cubic centimeters of blood, leukocytes 10,000, with lymphocytes 80 per cent, mononuclears 4 per cent, neutrophils, 16 per cent, eosinophils 0 and basophils 0.

From the Medical Service of Glenn Dale Sanarium.

1. Reyersbach, G., and Lenert, T. F.: Infectious lononucleosis Without Clinical Signs or Symptoms, m. J. Dis. Child. **61**:237 (Feb.) 1941.

2. Wilson, C. P., and Cunningham, R. S.: Conderation of Supravital Method of Studying Blood in ases of Mononuclear Cell Response, Folia haemat. 8:14 (March) 1929.

3. Smith, C. H.: Infectious Lymphocytosis, Am. J. is. Child. **62**:231 (Aug.) 1941.

4. Duncan, P. A.: Acute Infectious Lymphocytosis, Am. J. Dis. Child. **66**:267 (Sept.) 1943.

Nov. 25, 1942: Erythrocytes 4,500,000, hemoglobin 75 per cent, or 12.5 Gm. per hundred cubic centimeters of blood, leukocytes 40,400, with lymphocytes 80 per cent, mononuclears 4 per cent, neutrophils 9 per cent, eosinophils 6 per cent and basophils 0.

blood, leukocytes 87,400, with lymphocytes 93 per ce mononuclears 0, neutrophils 3 per cent, eosinophils per cent and basophils 0.

The stained smear showed small lymphocytes pr dominating, fewer large lymphocytes and a very fe

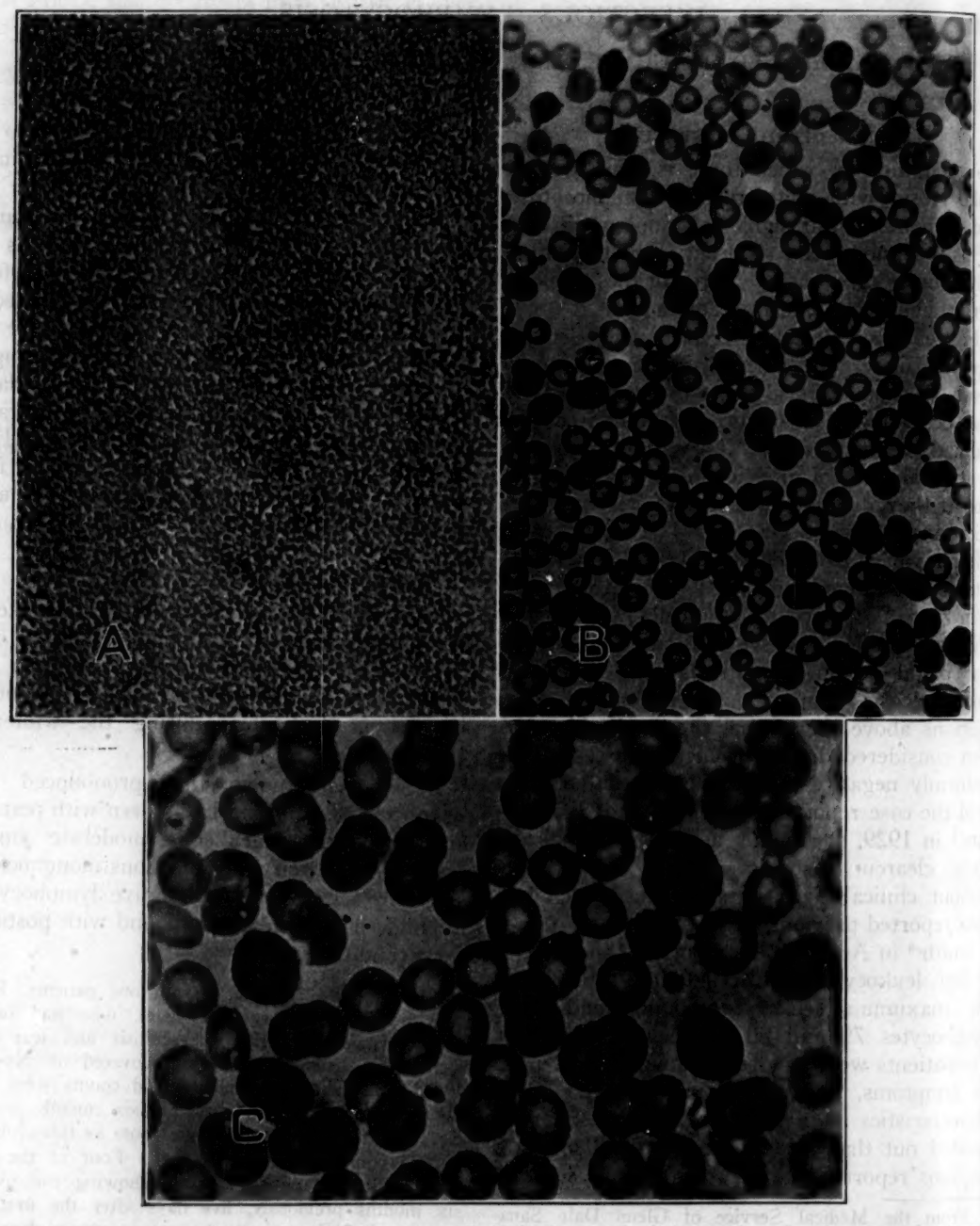


Fig. 1.—Blood picture in case 1: *A*, low power; *B*, high power; *C*, oil immersion, showing the great increa in normal-appearing lymphocytes.

Nov. 30, 1942: Erythrocytes 4,750,000, hemoglobin 57 per cent, or 9.5 Gm. per hundred cubic centimeters of blood, leukocytes 73,100, with lymphocytes 91 per cent, mononuclears 0, neutrophils 6 per cent, eosinophils 3 per cent and basophils 0.

Dec. 8, 1942: Erythrocytes 4,750,000, hemoglobin 54 per cent, or 9.0 Gm. per hundred cubic centimeters of

polymorphonuclears, eosinophils and monocytes. The were all well stained and normal looking, but in add tion there were a few poorly stained degenerated "smudge" cells, interpreted as degenerated lymphocyt The erythrocytes seemed normal in appearance. T platelet count by the smear method on Dec. 1 w 171,000, which was not considered unusual (fig. 1,

and *C*). A pediatric consultation brought various opinions, and it was decided to observe the patient further.

On Dec. 8, 1942, the same day that the first patient, R. C., had his maximum count, another case of lymphocytosis was discovered. The patient, W. McK., who was 4½ years of age, had a leukocyte count of 21,300, with 83 per cent lymphocytes, in the morning and of 54,300, with 88 per cent lymphocytes, about six hours later. The stained smear had practically the same appearance as that in the previous case except that there were more "smudge" cells (fig. 2).

On Dec. 10, 1942, the first patient, R. C., showed a slight drop of the leukocyte count, from 87,400 to 84,000, but the percentage of lymphocytes remained at 93 per cent. The second patient on this day had a rise in the number of leukocytes from 54,300 to 63,900, and the percentage of lymphocytes increased from 88 to 90 per cent. The platelets numbered 134,000.

The Paul-Bunnell, or heterophil antibody test was done on both patients the following day, Dec. 11, 1942. It gave negative results in both instances, i. e., positive agglutination only up to 1:32 for the first patient and up to 1:8 for the second.

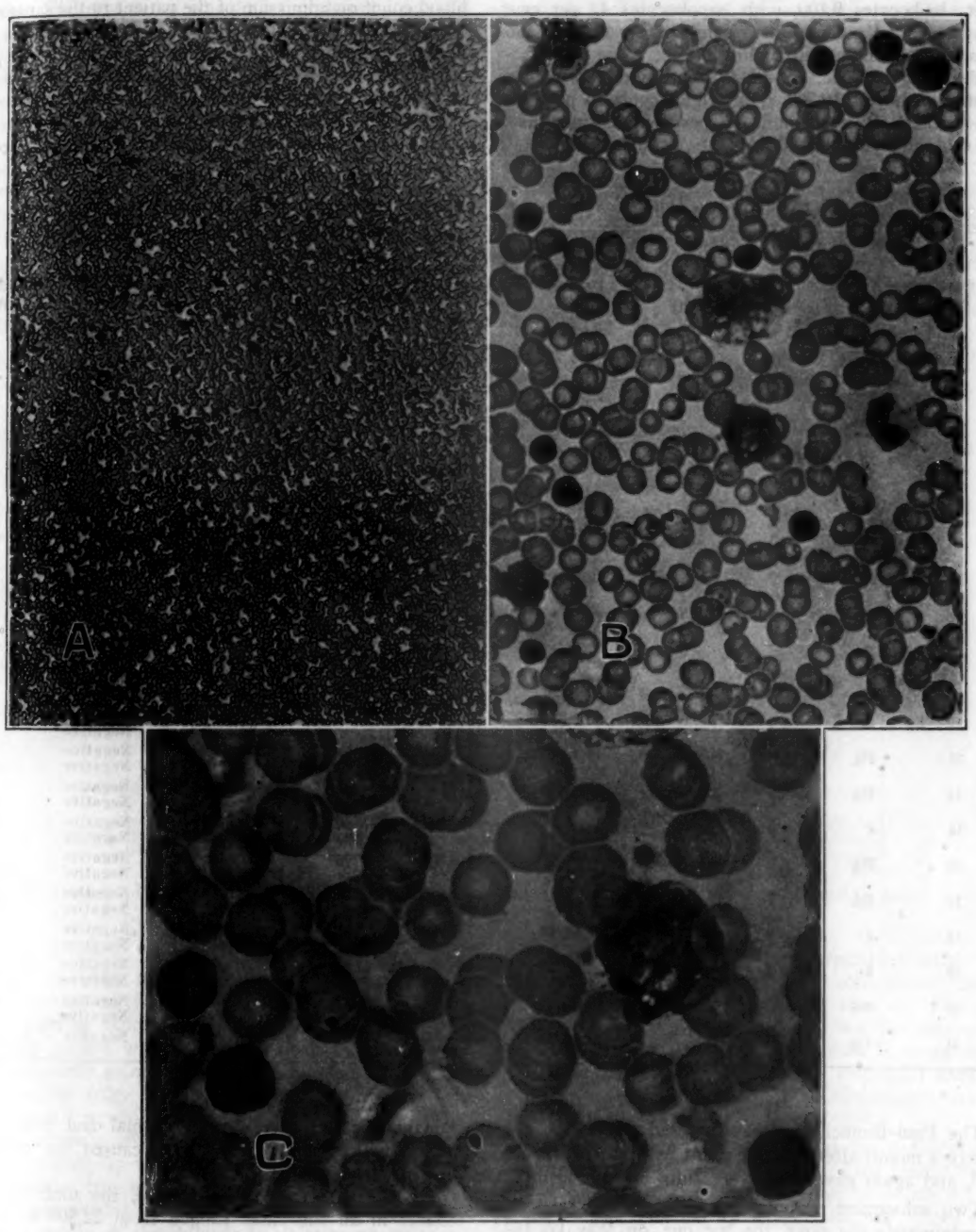


Fig. 2.—Blood picture in case 2, in which the highest total count of this series occurred: *A*, low power; *B*, high power; *C*, oil immersion, showing a picture similar to figure 1.

From then on the leukocyte count and the percentage of lymphocytes of both of these patients gradually dropped to normal, the first more slowly than the second, with, however, a rise in the percentage of eosinophils, as follows:

R. C. on Jan. 12, 1943, forty-eight days after the onset: leukocytes 9,100, with lymphocytes 42 per cent, mononuclears 4 per cent, neutrophils 42 per cent, eosinophils 12 per cent and basophils 0.

W. McK. on Dec. 26, 1942, eighteen days after the onset: leukocytes 10,200, with lymphocytes 50 per cent, mononuclears 0, neutrophils 45 per cent, eosinophils 5 per cent and basophils 0.

three and after five months, in May and in July. the first series of counts, started Dec. 18, 1942 completed Dec. 28 there were discovered 15 additio cases. Three more cases were discovered later in t way, 1 on Jan. 4, 1943 and 2 on January 12. The l or twenty-first, case was, strangely, detected by rou blood count on admission of the patient to the sanator from Washington, D. C. This patient's condition at first suspected of being whooping cough, but p tests were negative for the Bordet-Gengou bacillus, cough improved and no cases of whooping co developed in the institution. Furthermore, a roentge gram of the chest revealed severe primary infecti

Laboratory Data Concerning an Epidemic of Infectious Lymphocytosis

Case No.	Age, Yr.	Sex	Race	Approximate Date of Onset	Maximum Number of Leukocytes per Cu. Mm.	Percentage of Lymphocytes	Paul-Bunnell Test		Duration, Wk.
							Date	Result	
1	3	♂	W	11/25/42	87,400	93	12/11/42 2/ 4/43	Negative Negative	7
2	4½	♂	N	12/ 8/42	63,900	90	12/11/42 2/ 4/43	Negative Negative	2½
3	2	♂	N	12/18/42	43,900	73	12/24/42 2/ 4/43	Negative Negative	3
4	3	♂	N	12/24/42	103,600	86	12/30/42 2/17/43	Negative Negative	3
5	4½	♂	W	12/26/42	44,000	70	12/30/42 2/ 4/43	Negative Negative	3
6	4½	♀	W	12/26/42	49,800	92	12/30/42 2/25/43	Negative Negative	6
7	1½	♀	N	12/26/42	24,000	65	12/30/42 3/ 9/43	Negative Negative	6
8	2½	♀	N	12/26/42	105,100	91	12/30/42 3/ 9/43	Negative Negative	4
9	2	♀	N	12/26/42	120,000	97	12/30/42 3/ 9/43	Negative Negative	6½
10	1½	♂	N	12/28/42	75,000	92	12/30/42 2/17/43	Negative Negative	3
11	2	♂	N	12/28/42	41,800	83	12/30/42 2/17/43	Negative Negative	3
12	2	♀	W	12/28/42	72,400	92	12/30/42 2/25/43	Negative Negative	6
13	2½	♀	W	12/28/42	22,500	85	12/30/42 2/25/43	Negative Negative	6
14	5½	♀	N	12/28/42	55,500	85	12/30/42 2/25/43	Negative Negative	6
15	2	♀	N	12/28/42	42,900	62	12/30/42 3/ 9/43	Negative Negative	6
16	2½	♀	N	12/28/42	62,000	75	12/30/42 3/ 9/43	Negative Negative	3½
17	1½	♀	N	12/28/42	55,800	91	12/30/42 3/ 9/43	Negative Negative	3½
18	2	♀	N	12/28/42	42,000	71	12/30/42 3/ 9/43	Negative Negative	6
19	3	♂	W	1/12/43	68,600	91	1/13/43 2/17/43	Negative Negative	4
20	2½	♂	N	1/12/43	79,800	78	1/13/43 2/17/43	Negative Negative	4
21	1½	♂	N	2/25/43	32,300	93	2/25/43	Negative	3

The Paul-Bunnell test was repeated on Feb. 4, 1943, nearly a month after the last count had returned to normal, and again gave negative results in both instances.

Two subsequent counts at two month intervals were approximately the same, the last one, on May 17, 1943, revealing only slight further reductions. Soon afterward the first patient, R. C., was discharged from the sanatorium, in good health as far as could be determined.

Other Cases.—Because of the possibility that these 2 cases might be part of an epidemic occurring unnoticed, leukocyte and differential counts were then done again on all the approximately 100 children in the sanatorium. The counts were repeated at intervals of from five to fourteen days for about six weeks (through Feb. 10, 1943) and were done again after

tuberculosis with large peribronchial and hilar lym nodes, which might easily have caused the cough pressure reflex on the bronchi.

As can be seen from the table, the total leukocy counts in all the cases ranged from 22,500 to 120,0 and the percentage of lymphocytes from 62 to 97 p cent. The last-named percentage occurred in the c in which there was the highest maximum total cou Figure 3 shows the course of the total leukocyte cou in the cases with the highest, the lowest and a medi count. The blood pictures were similar in all ca and resembled those in the first 2 cases (figs 1 and Persistent eosinophilia was noted in the majority of t cases, either at the height of the lymphocytosis or s after the drop toward normal.

The Paul-Bunnell test was done in all of the ca of lymphocytosis, once during or slightly after t

ght of the count and again a month or so after the hest count. It gave uniformly negative results in cases; i. e., it gave positive agglutination only in utions of 1:16, 1:8 or 1:4, except in the first case which a dilution of 1:32 also gave a positive result. is evident that none of these results could be called sitive. The repeat test was done to rule out infectious nonucleosis as the cause of this condition, since it s been stated that this test may give negative results ring the acute stage and then become positive a nth or so later.

Throat cultures were made of material from the roats of all the patients; they gave no clue to the use of the condition. Micrococcus catarrhalis was esent in all the patients. Other organisms found in der of frequency were: Friedländer's bacillus, Pneumococcus, Bacillus influenzae and viridans and other reptococci. All of the patients with lymphocytosis re isolated when discovered, those of the same sex d color being placed in one room.

Incidence.—The patients were almost evenly divided to sex, as follows: girls, 11, 3 white and 8 Negro; Examination of feces for intestinal parasites gave negative results.

In none of the patients were there observed enlarged cervical glands or palpable spleen, except in a few of the children in whom these conditions had been observed before as part of their primary tuberculous infection, and in no patient was there any additional enlargement. Furthermore, there was no sore throat or initial fever following a prodromal period of malaise, which is characteristic of infectious mononucleosis. These observations were confirmed by several consultants, including Dr. P. A. McLenden, of the Children's Hospital staff, Washington, D. C., and Drs. Michael L. Furcolow and Robert Olesen, of the United States Public Health Service, Bethesda, Md.

Stained blood specimens were examined by Dr. Hal Downey, of the University of Minnesota, and by Dr. Lester Newman, pathologist of Glenn Dale Sanatorium. Dr. Newman performed all of the Paul-Bunnell agglutination tests and examined all of the stained smears. Dr. Downey expressed the opinion that the blood smears did not resemble those obtained in infectious

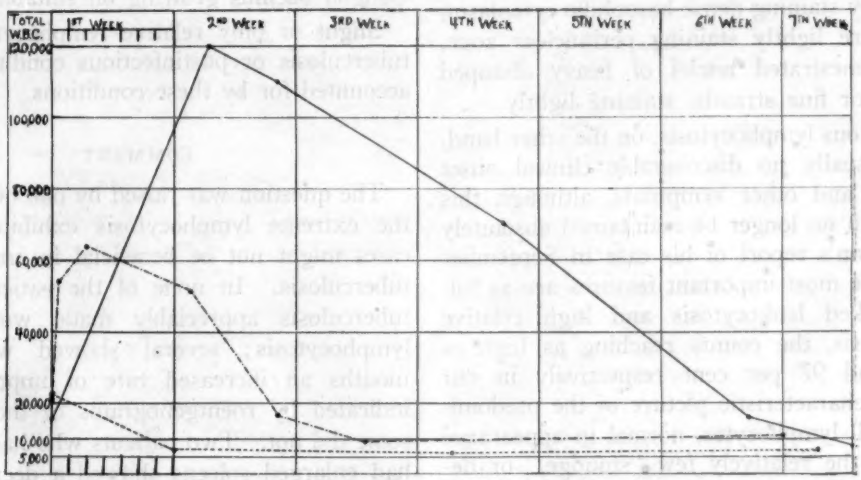


Fig. 3.—Course of 3 total leukocyte counts: highest count (—); lowest count (–), and a median count (- - -)

oys, 10, 3 white and 7 Negro. As the total ratio Negro to white children of both sexes in the sanatorium was approximately 4:1, the figures just given ould seem to indicate possibly a slightly greater susceptibility of the white children.

The majority of children were about 3 years old, the ges ranging from 1½ to 4½ except that there was Negro girl aged 5½ years.

Some of these children had severe primary tuberculous infections, as might be expected, but almost an qual number had only slight infections as was shown y roentgenograms of the chest.

In practically all the children in isolation nasopharyngitis developed toward the end of the period, after the otal counts had started to drop toward normal. In everal children this condition became severe. There ere high fever and bronchitis and bronchopneumonia as threatened; the use of sulfathiazole or of sulfadiazine was required. During this period (from December to February) severe infections of the respiratory ract were common among the very young in the children's wards. Therefore, it is felt that these symptoms ere coincidental rather than significant. A few of he very young girls had diarrhea for several days.

mononucleosis; they were more characteristic of chronic lymphatic leukemia. In cases of nonleukemic conditions, similar blood pictures are seen in whooping cough with as high a total count, but the percentage of lymphocytes is probably lower than in these cases. The practically negative results of heterophil antibody tests seemed to rule out, in his opinion, whatever is responsible for infectious mononucleosis.

Specimens of blood from some of the patients were examined by Dr. Michael Furcolow, of the United States Public Health Service, in an attempt to isolate a virus as the causative factor. His report follows: "No virus was isolated from any of these samples. Several samples were tested for virus-neutralizing antibodies against virus of lymphocytic choriomeningitis. No neutralizing antibodies were demonstrated."

DIFFERENTIAL DIAGNOSIS

In treating the condition described here as "infectious lymphocytosis", it seems important to us that a diagnosis be made as soon as possible. The three most important diseases to be dif-

ferentiated are infectious mononucleosis, lymphatic leukemia and pertussis.

Infectious mononucleosis has a clinical prodromal stage of malaise followed by an acute onset with fever, sore throat, pain in the back of the neck, enlargement and tenderness of the cervical lymph glands, enlargement of the spleen and the typical blood picture; the Paul-Bunnell test usually gives positive results sooner or later. Agglutination of sheep cells in dilutions of 1:56 to 1:112 is considered questionably a positive reaction, while agglutination of 1:160 or over is clearly positive. The blood picture is distinguished by lymphocytosis, which is usually not nearly so marked as in the condition described here. The stained smear shows the characteristic morphologic changes, i. e., the predominating abnormally large lymphocytic cells—often coarsely, less often finely, vacuolated—the deeply staining dense basophilic cytoplasm, with a more lightly staining perinuclear zone, and the fenestrated nuclei of heavy clumped chromatin or fine strands, staining lightly.

In infectious lymphocytosis, on the other hand, there is usually no discoverable clinical onset with fever and other symptoms, although this criterion can no longer be maintained absolutely since Duncan's report of his case in September 1943. The most important features are as follows: marked leukocytosis and high relative lymphocytosis, the counts reaching as high as 120,000 and 97 per cent respectively in our cases; the characteristic picture of the predominating small lymphocytes, normal in appearance except for the relatively few "smudge," or degenerated, cells in the stained smear, and the uniformly negative reaction to the Paul-Bunnell test in dilutions over 1:32.

Lymphatic leukemia in children is acute and rapidly progressive. It is always accompanied by anemia of varying degree and usually by a decrease in the number of platelets. In all cases there will be seen in the stained smears, with careful searching, evidence of the immaturity of the lymphocytes. They are large, round and uniform in size, with basophilic cytoplasm and large, lightly staining, finely granular nuclei, which contain nucleoli. In the aleukemic form there is leukopenia at the onset or throughout the disease; this form would seem to offer little difficulty in differential diagnosis. However, as was brought out by Falkenstein and Fowler,[5] the leukemic form is the more frequent by far in children under 6 years of age, while the aleukemic form is the more frequent in children a 6 to 10 years, and the two forms are equally f quent between the ages of 10 and 15. In leukemic form of the disease the leuko count may reach 300,000 to 400,000 or ov there are clinical signs and symptoms of larged lymph glands and spleen, fever, hem rhages, cough, dyspnea and roentgen signs to enlarged mediastinal lymph nodes. T average duration until death was only ab eighteen weeks for the 61 cases reported by th authors.

Infectious lymphocytosis does not have th characteristics.

Pertussis may have a similar blood pictu i. e., a leukocyte count of 100,000 or more c with 90 per cent lymphocytes, but there are characteristic clinical symptoms, and in a dou ful case the plate test will show the Bord Gengou bacillus growing on suitable medium

Slight or only relative lymphocytosis due tuberculosis or postinfectious conditions can accounted for by these conditions.

COMMENT

The question was raised by one of us wheth the extreme lymphocytosis exhibited in the cases might not be beneficial in combating t tuberculosis. In none of the patients was t tuberculosis appreciably made worse by t lymphocytosis; several showed within thr months an increased rate of improvement indicated by roentgenograms of the chest, a some did not. Two patients who had previous had enlarged spleens showed a decrease in t size of the palpable spleen and an increased ra of clinical improvement within a three mon period.

SUMMARY

Twenty-one cases of leukocytosis in childre from 1½ to 5½ years of age are herewith re ported; the leukocyte counts ranged from 22,5 to 120,000, with a relative lymphocytosis of 62 97 per cent. In the majority of cases the tot counts were over 40,000, while in 3 they we over 100,000; in all except 4 instances the pe centage of lymphocytes was 85 or over, and i these 4 it was 62 plus.

All of these cases except 1 occurred in ep demic form in the children's wards of Glen Dale Sanatorium, Glenn Dale, Md.; the othe case was detected on admission of the patient t the sanatorium from Washington, D. C.

In none of the cases was there any sympto at the onset, the condition being discovered i every instance by routine blood counts.

5. Falkenstein, D., and Fowler, W. M.: Acute Lymphatic Leukemia in Childhood, Am. J. Dis. Child. 65:445 (March) 1943.

The average probable duration of the leukosis was approximately four and seven-tenths weeks, the longest seven weeks and the shortest two and one-half weeks.

In the majority of cases eosinophilia appeared the total count began to drop. In a few this curred during the highest count and persisted seven months.

It is our impression that the cause of this condition is an infectious agent, but efforts to demonstrate a bacterial or virus cause in these cases were fruitless.

Advice and assistance in the study of these cases was given by Dr. Hal Downey of the University of Minnesota, Dr. Michael L. Furcolow of the United States Public Health Service and the laboratory staff of Glenn Dale Sanatorium, under the direction of Dr. Lester Newman, pathologist, and including Miss Ruth Haines, Miss Ada Murphy and Mr. Bernard Lewis.

Glenn Dale Sanatorium.

HEREDITARY PERIODIC PARALYSIS IN A FAMILY SHOWING VARIED MANIFESTATIONS

C. P. OLIVER, PH.D.; MILDRED R. ZIEGLER, PH.D., AND IRVINE McQUARRIE, M.D.

MINNEAPOLIS

Periodic family paralysis is a relatively rare disease of human beings. In an extensive review of the literature on the subject, Talbott [1] stated that approximately 400 typical cases have been reported since Musgrave [2] first described a case in 1727.

The disease is characterized by the periodic development of acute flaccid paralysis, which usually begins in the extremities and progresses toward the trunk. The patient loses the power to move his limbs, but he can usually breathe, eat and speak freely, and the functions of his internal organs appear not to be disturbed. The deep reflexes of the affected extremities are absent at the height of the attack. After a period of time, usually a few hours, but in some instances two or three days, the patient recovers from the attack spontaneously. Another attack may occur within twelve to twenty-four hours or after a longer interval. During the attacks, the levels of serum potassium and inorganic phosphorus tend to be low, while during periods of freedom they are normal. The attacks usually occur during the latter part of the night or early in the morning and are often preceded by excessive exercise, fatigue or ingestion of an excess of carbohydrates during the previous day. Attacks can usually be induced in persons who have the potentiality for them by the administration of large amounts of carbohydrate or by the use of certain agents, such as insulin and epinephrine, which are known to lower the level of serum potassium.

The familial occurrence of periodic paralysis has been recognized, according to Talbott, since the report of Shakhnowitsch [3] in 1882. Although both sporadic and familial instances of the disease have been reported in persons whose parents were normal, the instances due to heredity are usually considered to have resulted from the transmission of a dominant trait. However, some of the atypical conditions reported to be periodic paralysis may have been due to extrinsic factors or to other disorders, complicated by a marked reduction in the serum potassium, which cause symptoms resembling those of periodic paralysis.

Even though the inheritability of periodic paralysis is well known, the family history to be reported here is of particular genetic importance because of the varying manifestations in the family. The affected members show many of the different expressions of the trait that are found when nonrelated affected persons are compared.

FAMILY HISTORY

The pedigree of family B, a family of Scandinavian ancestry 16 members of which have had periodic attacks of paralysis, is shown in the chart.

The propositus of family B (indicated on the chart by an arrow) is a normal-appearing boy strong and healthy except for the intermittent attacks of flaccid paralysis. Typical attacks which have been observed by the writer, begin acutely as "stiffness" of the muscles, but progress rather rapidly until he becomes helpless. He does not lose consciousness and is able to swallow and breathe without difficulty. On one occasion only have the respiratory muscles been involved. Within eight to twenty-four hours the paralysis gradually disappears, leaving him with no apparent harmful after-effect. As many as three or four episodes of this character may occur during the week. At times, they have occurred daily. Attacks can be induced experimentally at will by feeding the patient 100 to 150 Gm. of dextrose, by injecting 30 to 50 units of insulin or by a combination of these procedures. They can be terminated by oral administration of 5 Gm. of potassium chloride dissolved in a glass of water.

The propositus has served as the subject of extensive metabolic studies at the University of Minnesota Hospital, the results of which will be reported separately. An elder brother (16 years of age) of the propositus has also been

Read at the Annual Meeting of the American Pediatric Society, Sept. 26, 1944.

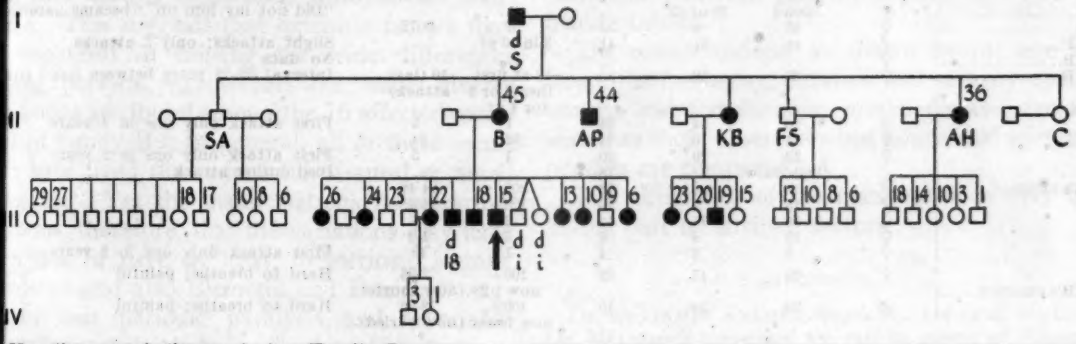
From the Departments of Pediatrics and Zoology and the Dight Institute for Study of Human Heredity, University of Minnesota.

1. Talbott, J. M.: Medicine **20**:85, 1941.
2. Musgrave, W.: Phil. Tr., London **3**:33, 1727.
3. Shakhnowitsch: Russk. Vrach **32**:537, 1882.

served during his attacks. Genetic data on er members of the family have been collected interviews or by correspondence with the ents and with each of the uncles and aunts the propositus.

In this family, the trait behaves as a mendelian minant character. The affected father in neration I transmitted the potentiality to one his 3 sons and to 3 of his 4 daughters. One ughter, B, the mother of the propositus, has oduced 13 children. Two of these died during ancy. Of the other 11, 9 have had one or re attacks of the paralysis. Another daugh-, KB, has 2 children who have had attacks of paralysis and 2 who have been free of at-ks. The other affected daughter, AH, has 5 ldren, of whom none at the time of writing d yet had paralysis. However, 4 of the chil-n are less than 16 years of age, and may yet ve the disease. The affected son of gener-on II, AP, has no children.

None of the affected persons in family B came m nonaffected parents. In this family, there-



Hereditary periodic paralysis: Family B.
Males are represented by squares and females by circles. Solid squares and circles represent persons who ve had attacks of paralysis.
Roman numerals refer to generations. Arabic numerals refer to age in 1944. The letter *d* indicates death; accompanying numeral gives the age at death; *i* refers to infancy.

re, penetrance is complete, but the expression the trait is varied. This variable manifesta-n suggests why in some of the hereditary ses the disease may seem to have skipped nerations. Member AP, in generation II, had s first of three attacks at the age of 31; S, in neration I, had his first attacks, according to S, at 35, although B stated that this person d his first attack at 19. The eldest daughter B had her first attack at 24. The late ages onset in some of the members and the varia-n observed in the other characteristics of the sease indicate that a potentiality may not al-ys be expressed, because of extrinsic factors or modifying (secondary) genes.

VARIED MANIFESTATIONS

The affected members of family B show many the varied expressions of periodic paralysis which are found when nonrelated families are compared. Data on various manifestations observed in the family are grouped in the table.

The most troublesome age periods are puberty and adolescence. In approximately 60 per cent of all cases reported the first attacks have come before the age of 16 years.[3] Some persons have the first paralytic attacks as early as the fourth year of life.[4] In others, the first attack occurs as late as 40 years. The earliest onset in family B (table, column 4) was at the age of 4 years, and the latest at 31, or possibly at 35 years if the statement of FS about S is correct. Six of the 16 affected members had the first attack during the first decade, 5 during the second decade, 2 after age 20 and 1 at either 19 or 35. Data regarding age at onset for 2 affected members are not available.

Attacks may occur every night over a period of time or only once or twice in a lifetime. Reports indicate that attacks usually become less frequent with age. However, Mitchell, Flexner and Edsall [4b] reported that there was a long interval of freedom between the first and second attacks and that thereafter the attacks were more frequent. In 3 members of family B (column 6) the first attack was the only one in two years. Member AP had only three attacks in ten years. Some have had only two to five attacks a year, but others have them as often as two or three times each week. Member AH and the children of KB had frequent attacks at first, but their attacks became fewer with increasing age. AH reported that after her first paralysis she had one attack a month for about six years and then two or three a year for four years; she was then free of attacks for thirteen years, having had her latest attack in

4. (*a*) Biemond, A., and Daniels, A. P.: Brain **57**: 91, 1934. (*b*) Mitchell, J. K.; Flexner, S., and Edsall, D. L.: ibid. **25**:109, 1902.

1943. The children of KB had two or three attacks each week during the early period of the disease; they are now having fewer attacks.

As is shown by column 7 of the table, the affected members of family B differ considerably in the duration of the attacks. The paralysis in 1 person lasted only one or two hours. Four others had attacks of ten hours or less. Paralysis in 5 lasted from one to three days. In 2 others, the attacks lasted three to four days at the earlier ages, but according to their mother (KB), in more recent times the attacks have been of shorter duration. In the son of KB, at the time of writing the attacks occur late at night and are gone the next day, although he may become paralyzed again during the next night. This family, therefore, shows the same general behavior as that found when all cases of periodic paralysis are compared. The average attack can be expected to last six to eight hours, although in some persons it may last as long as four days.

In some persons the attacks are severe, while in others they are very slight. It is also of interest that the disease seems to leave no ill after-effects in most persons. In family B most of the members do not complain of any difficulties as a consequence of the paralysis. The three attacks of AP have been slight. Member AH is able to "walk it off" when she has the prodroma, a condition also reported in a patient by Mitchell, Flexner and Edsall.[4b] However, both affected children of KB are in pain during the attacks and find it difficult to breathe. One sibling of the propositus died in 1942 during a typical attack; death was due to paralysis of the respiratory muscles. According to one of his sons, S, in generation I, did not have severe attacks: They "did not lay him up." During the last twelve years of his life, however, S gradually lost the use of his legs and finally became helple... There is no way of knowing whether his c... dition was similar to that occurring in a fam... group described by Biemond and Daniel... Muscular atrophy with periodic paralysis o... curred in some of the members of that fam... There is no evidence that the repeated perio... attacks have led to a more severe anomaly ... members of this family, with the possible exc... tion of S.

According to most reports, not only do ... frequency and the severity of the attacks ... crease with age, but the disease tends to ... appear in late adult life. In the family histo... recorded by Biemond and Daniels, 4 of ... affected members had supposedly reached ... age of freedom from attacks. However, as ... shown by family B, the freedom may be m...

Varying Forms of the Periodic Attacks of Affected Members of the Family

Person *	Sex	Age in 1944	Age at First Attack	Age at Latest Attack	Number of Attacks During a Yr.	Duration of an Attack in Hr.	Comment
S	♂	Dead	19 or 35	..	..	..	"Did not lay him up"; became paralyz...
B	♀	45	9	32	52	48-72	
AP	♂	44	31	41	3 in 10 yr.	..	Slight attacks; only 3 attacks
KB	♀	..	..	..	..	..	No data
AH	♀	36	12	35	12 at first then 2 or 3 for 4 yr.	10 (last attack)	Interval of 13 years between last 2 att...
B's children	♀	26	24	24	1	5	First attack only one in 2 years
	♀	24	6	24	52	24	
	♀	22	20	20	1	5	First attack only one in 2 years
	♂	Died 1942	..	18	..	..	Died during attack
	♂	18	8	18	200	24-48	
	♂	15	7	15	100+	24-48	
	♀	13	11	12	2	4	
	♀	10	9	9	5	1-2	
	♀	6	4	4	1	48	First attack only one in 2 years
KB's children	♀	23	13	22	100+ now 1-2	72-96 (now shorter)	Hard to breathe; painful
	♂	20	14	19	100+ now fewer	72-96 (now varied)	Hard to breathe; painful

* The members are given in the order shown in the pedigree chart.

apparent than real. Most members of gener... tion III are too young for the attacks to ha... discontinued, although the duration of the illne... ranges from one to eighteen years. The moth... of the propositus had the attacks for twenty... three years, but has had none during the pa... thirteen years. Member AH had also been fr... of the attacks for thirteen years when she h... her latest attack in 1943. Subsidence of th... condition, then, may not be permanent. Th... potentiality may be present, while the factor... necessary to bring on the attacks may be le... likely to occur in older persons. Whether th... absence of the necessary factors is due to ... change in the diet, a lack of strenuous exercis... or a change in the physiologic processes relat... to the muscles is not known.

COMMENT

Sixteen members of the family described ... this study have had attacks of periodic paraly...

e trait behaves as a simple mendelian domi-
t with complete penetrance but with varying
nifestations.

n this one family, the affected members
ibit almost as many different expressions of
trait as are found among many nonrelated
sons with this disease. The age of onset, as
wn by the age at the first attack, ranges from
o 31, or possibly to 35 years, a variation as
le as that in the family described by Biemond
d Daniels.[4a] During a year, some members
e only one or two attacks. Some of them,
wever, have one or more weekly. Although
attack tends to last for a few hours only in
ne of the members, some have attacks that
t two to four days. In general, the attacks
not severe and have no harmful effects.
owever, 1 member died during an attack, and
other, S, may have become paralyzed as a
nsequence of the attacks.

The extremely varied expression of the heredi-
y trait is observed when nonrelated persons
o have attacks of periodic paralysis are com-
red. This suggests that extrinsic factors may
important in causing the wide differences
ong persons. However, the same diverse
nditions are found among the 16 affected mem-
rs of family B. In general, all of these mem-
rs have lived the same kind of rural or small
wn life. Yet the manifestations have varied.
seems, therefore, that the variations may have
en due in part, at least, to intrinsic factors.
nders[5] and also Biemond and Daniels[4a] sug-
sted that periodic paralysis and associated
uscular atrophy in a family they described can
explained on the basis of two pairs of genes.
dominant gene of one pair is necessary for
e occurrence of periodic paralysis, and one
minant gene of the other pair is necessary if
uscular atrophy is to develop, but the gene for
uscular atrophy is unable to function unless
e gene for periodic paralysis is present. It is
own that the paralysis is associated with a
sturbed concentration of certain chemical con-
tuents of the body fluids, especially potassium,
d that the attacks tend to occur after a heavy
eal of carbohydrates and after strenuous ex-
cise. The change in frequency, intensity and
ration of the attacks with increased age may
related to changes in habits of life. But it
rdly seems likely that the differences among
e younger members of family B can all be
aced to differences in habits.

The data on family B give no evidence regard-
g the nature of the inherited anomaly which
ads to the redistribution of potassium between
the blood and the tissues. Gardner[6] and also Pudenz, McIntosh and McEachern[7] referred to the condition as an inborn metabolic defect. Allott and McArdle[8] considered the cause to be related to an abnormal neuromuscular apparatus.

The hereditary character of periodic paralysis might well be taken into account in studying the early and preclinical signs of the disease, particularly as regards a comparison of the chemical concentrations of the susceptible and nonsusceptible members of a family. In family B, however, only one sibship is available for study, and only 1 of the 2 nonaffected members of that sibship can be examined. An affected daughter of B has 2 young children, who by continued examination might provide some valuable information about the preclinical course of the disease.

SUMMARY

Sixteen members of a family are subject to attacks of periodic paralysis.

The trait behaves in this family as a mendelian dominant with full penetrance but with varied manifestations.

The manifestations, as shown by the age of onset, the frequency, duration and severity of the attacks and the duration of the disease, are as varied as those observed when nonrelated affected persons are compared.

The variability of the manifestations may be due in part to intrinsic factors.

DISCUSSION

DR. BENJAMIN KRAMER, Brooklyn: I wonder whether Dr. McQuarrie correlated the various effects of changes in diet and the intensity of the attacks with the potassium in the blood. As a rule, I think the attacks come on when the level of potassium is about 10 mg. or less per hundred cubic centimeters.

DR. IRVINE MCQUARRIE, Minneapolis: Yes. Serum potassium values were determined at fairly frequent intervals throughout the entire period of study. All attacks of paralysis were associated with reduced values, usually below 12 mg. per hundred cubic centimeters. During periods of freedom from attacks, normal levels were usually found. When the carbohydrate to potassium ratio of the diet approached the threshold for attacks, serum values fluctuated between 12 and 15 mg. per hundred cubic centimeters.

DR. BENJAMIN KRAMER, Brooklyn: Well, does it matter how the potassium fluctuates in the diet?

DR IRVINE MCQUARRIE, Minneapolis: Our results indicate that wide fluctuations in the potassium content of the diet may be made without the occurrence of paralytic attacks so long as the carbohydrate to potassium ratio falls below certain levels. The last vary somewhat with the proportions of protein, carbohydrate and fat in the diet.

5. Sanders, J.: Genetica **16**:365, 1934.

6. Gardner, H. W.: Brain **35**:243, 1912.

7. Pudenz, R. H.; McIntosh, J. F., and McEachern, D.: J. A. M. A. **111**:2253, 1938.

8. Allott, E. N., and McArdle, B.: Clin. Sc. **3**:229, 1938.

SPORADIC INFECTIONS DUE TO SALMONELLA IN INFANTS

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The investigations of Kauffmann in Denmark, of Hormaeche and his collaborators in Uruguay and of Edwards, Schiff, Seligmann, Bornstein and Saphra in the United States have added substantially to the knowledge of the antigenic structure and the incidence of paratyphoid bacilli and of infections due to Salmonella in animals and in human beings. Certainly infections caused by Salmonella in human beings are more common than was believed even a few years ago, and vital statistics do not give a true picture of their prevalence. This is evident from a perusal of recent literature.

A number of reports have been published pertaining to epidemic outbreaks of salmonellosis in infants. Among others, McKinlay [1] described an epidemic of infectious diarrhea of the newly born. Unfortunately, the type of Salmonella responsible for the disease was not determined. Aballí, Falcón, Sala Panisello, Curbelo and Martinez Cruz [2] observed an outbreak of Salmonella aertrycke infection complicated by meningitis. Recently, Abramson, Frant and Oldenbusch [3] reported several fatal cases of Salmonella Panama infection in babies 9 to 15 days of age. The infants in these cases were all cared for at the same nursery.

Except for reports of isolated cases, the literature on sporadic infections due to Salmonella in infants is limited. The most extensive investigation of the subject was carried out in Uruguay, by Hormaeche and his collaborators. A summary in English of their findings has been published recently.[4] It is evident from their studies that Salmonella organisms of various types a responsible for many instances of infan summer diarrhea in that part of the wo Bornstein and Schwartz [5] described 5 cases sporadic infections due to Salmonella in infa Four of the patients suffered from diarrheal d ease; S. typhi murium was present in the fe of 2 infants and Salmonella Newport a Salmonella Montevideo in 1 infant each. T fifth patient had peritonitis due to S. ty murium. Seligmann and Hertz [6] reported cases of infections due to Salmonella occurri in infants without fatality.

During the last three years 20 cases Salmonella infections in infants have been served at this hospital. In each instance t type of Salmonella organism involved was det mined. A few unusual types were encounter Since 4 of these cases ended fatally, it is evid that such infections are not always benign. T circumstances justify a report of the clinical a bacteriologic observations on these cases.

METHOD OF INVESTIGATION

Before the clinical aspects of the cases are describ brief mention will be made of the bacteriologic meth used in the investigation. Cultures of stools of all p tients with diarrheal disease were made. The samp of feces were seeded on suitable mediums as soon they were received in the laboratory. Endo, McConk Salmonella-Shigella and desoxycholate-citrate agar w used. During the last six months the enriching fluid Bangxang and Eliot [7] was also employed. Bism sulfite agar was included when indicated.

Lactose-nonfermenting colonies were fished from t agar plates after incubation at 37 C. for twenty-f and occasionally for forty-eight hours. Isolated stra were then tested for motility and for their action dextrose, maltose, mannitol, lactose, sucrose, dulci rhamnose, xylose, salicin and sorbitol. These test s stances were employed in the form of a 1 per c solution in phenol red (phenolsulfonphthalein) bro Inverted tubes were used for the determination of t

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1. McKinlay, B.: Infectious Diarrhea in New Born Caused by Unclassified Species of Salmonella, Am. J. Dis. Child. **54**:1252 (Dec.) 1937.

2. Aballí, A. A.; Falcón, S.; Sala Panisello, F.; Curbelo, A., and Martínez Cruz, J. A.: Salmonelosis del recién nacido, Bol. Soc. cubana de pediat. **9**:123 (April) 1937.

3. Abramson, H.; Frant, S., and Oldenbusch, C.: Salmonella Infection of the Newborn: Its Differentiation from Epidemic Diarrhea and Other Primary Enteric Disorders of the Newborn, M. Clin. North America **23**:591 (May) 1939.

4. Hormaeche, E.; Surraco, N.; Peluffo, C., and Aleppo, P.: Causes of Infantile Summer Diarrhea, Am. J. Dis. Child. **66**:539 (Nov.) 1943.

5. Bornstein, S., and Schwartz, H.: Salmone Infection in Infants and Children, Am. J. M. Sc. **2** 546 (Oct.) 1942.

6. Seligmann, E., and Hertz, J. J.: Salmonella fections, Ann. Int. Med. **20**:743 (May) 1944.

7. Bangxang, E., and Eliot, C. P.: An Investig tion of Preserving Solutions for the Recovery of Dys tery Bacilli from Fecal Specimens, Am. J. Hyg. **31** (Jan.) 1940.

nation of the gas. The strains were tested also for r ability to form indole. Agglutination tests were ried out with a few Salmonella serums available at laboratory. Through the cooperation of Dr. Erich gmann, of the New York Salmonella Center, all ins were studied serologically and their type designa- was established.

OBSERVATIONS

The table presents the pertinent data on the cases of infection due to Salmonella in infants h respect to age, sex and race of the patients, 1 of these cases and also in 1 other case. Of the remaining 2 cases, 1 involved a carrier of Salmonella typhi murium with an infection of the upper respiratory tract and the other an infant who presented a feeding problem without diarrheal disease. The diagnosis of Salmonella infection in each of these cases was either based on or corroborated by the bacteriologic findings.

Salmonella organisms were isolated from feces in 19 cases. In the remaining case S. typhi murium was recovered from blood but not from

Sporadic Infections Due to Salmonella in Infants

se	Age	Sex	Race	Diagnosis	Stool Culture	Blood Culture	Sulfonamide Compounds Given	Outcome
1	5 mo.	♂	W	Acute enterocolitis, bacteremia, phlebitis	—	S. typhi murium	Sth.	Died
2	6 mo.	♂	W	Acute enterocolitis	S. typhi murium	..	Sc.	Improved
3	1 mo.	♂	N	Acute enterocolitis, infection of upper respiratory tract, otitis media	S. typhi murium	..	Sc.	Improved
4	5 mo.	♂	W	Bacteremia, broncho-pneumonia	S. typhi murium	S. typhi murium	Sd.	Died
5	5 mo.	♂	W	Diarrhea, broncho-pneumonia	S. typhi murium	—	Sth. Sd. Sc.	Died
6	5 mo.	♂	W	Acute enterocolitis, laryngitis, eczema	S. typhi murium	..	Sth. Sc.	Improved
7	7 mo.	♂	W	Infection of upper respiratory tract, Salmonella carrier	S. typhi murium	..	S.	Improved
8	9 wk.	♂	W	Acute enterocolitis	S. typhi murium	..	Sc.	Improved
9	10 mo.	♂	W	Secondary anemia, diarrhea, otitis media, cervical lymphadenitis	S. typhi murium	—	Sth. Sc.	Improved
10	3 mo.	♂	N	Acute enterocolitis, otitis media, broncho-pneumonia	S. typhi murium	—	Sth.	Improved
11	3 mo.	♀	W	Acute enterocolitis	S. typhi murium	..	Sth. Sc.	Improved
12	11 days	♀	W	Acute enterocolitis, bronchopneumonia, peritonitis	S. typhi murium	—	..	Died
13	2½ mo.	♂	W	Acute enterocolitis, tetany	S. typhi murium	..	..	Improved
14	3 wk.	♂	W	Feeding problem; carrier	S. typhi murium	..	..	Improved
15	6 mo.	♀	W	Diarrhea, broncho-pneumonia, otitis media	S. paratyphi B	..	Sp.	Improved
16	9 mo.	♂	W	Diarrhea, secondary anemia	S. paratyphi B	—	Sd.	Improved
17	5 mo.	♀	W	Diarrhea, infection of upper respiratory tract	S. urbana	..	..	Improved
18	16 days	♀	W	Diarrhea	S. london	..	..	Improved
19	8 wk.	♂	W	Acute enterocolitis, tetany	S. anatis	..	..	Improved
20	4 mo.	♂	W	Diarrhea	S. derby	..	Sc.	Improved

* W indicates white; N, Negro; S., sulfanilamide, Sp., sulfapyridine, Sth., sulfathiazole, Sd., sulfadiazine, Sc., succinylsulfathia-e; —, negative; .., observation not made.

nical diagnosis, results of cultures of the stools d of the blood, treatment with sulfonamide mpounds and outcome.

Of the 20 patients, 3 were less than 4 weeks l; their ages at the time of the onset of the ness were respectively 11, 16 and 21 days. the remaining infants, 4 were between 1 and months, 8 between 3 and 6 months and 5 tween 6 and 12 months of age.

The clinical diagnosis of enterocolitis, gastro-teritis or diarrheal disease was made in 17 ses. Paratyphoid bacteremia was present in stools. Cultures of the blood were made in 7 cases. Salmonella organisms were recovered from the blood in 2 of these; in both instances S. typhi murium was the invading organism. The blood in the 5 other cases was sterile. The distribution of the various types of Salmonella was as follows: S. typhi murium, 14 cases; Salmonella paratyphi B, 2 cases, and Salmonella Urbana, Salmonella London, Salmonella Derby and Salmonella anatis, 1 case each.

Sixteen of the 20 cases ended in recovery and 4 in death. In 2 of the fatal cases bacteremia

from S. typhi murium was present. In the other 2 also the infection was due to S. typhi murium, the organisms being present in the intestinal tract.

None of the drugs used, including sulfathiazole, sulfadiazine and succinylsulfathiazole, was dramatically effective. Of 14 patients treated with one or more of these drugs 3 died and 11 recovered. There was 1 death among 6 infants who did not receive sulfonamide drugs. The 2 infants with bacteremia due to S. typhi murium were treated with sulfonamide compounds without any beneficial effect. Stools continued to contain pathogenic organisms in a number of cases during and following therapy with sulfonamide compounds, as for instance in case 20, previously described. It should be kept in mind that the various members of the Salmonella group differ in their susceptibility to treatment with sulfonamide compounds (Bornstein [8]).

A brief report of the fatal cases follows:

CASE 1.—A white boy 5 months old was admtited to the Children's Hospital because of vomiting and diarrhea which had begun one day previously. The condition developed two days after the child had been discharged from the hospital after treatment for eczema. During the present hospitalization his temperature ranged between 36 and 42 C. (96.8 and 107.6 F.). The diarrhea persisted, with up to twelve stools in twenty-four hours. Phlebitis was present. Sulfathiazole was administered to combat the infection, and because of dehydration, blood and fluids were given intravenously. Laboratory examinations resulted in the following pertinent findings: albuminuria; secondary anemia with a hemoglobin concentration which fell from 11 to 8 Gm. per hundred cubic centimeters of blood; a leukocyte count which ranged from 10,000 to 15,000; carbon dioxide-combining power of the plasma which varied from 25 to 50 volumes per cent; innumerable colonies of S. typhi murium on two consecutive cultures of the blood and absence of pathogenic organisms from the stools as demonstrated by two cultures. After a stay in the hospital of two and one-half weeks the patient died. Postmortem examination revealed the following conditions: serous hemorrhagic enterocolitis; generalized anemia with marked icterus, and considerable fatty degeneration and icterus of the liver.

CASE 4.—The other case of bacteremia due to S. typhi murium differed in many respects from the preceding one. The patient, a white boy 5 months old, had a history of a cold for four days prior to his admission. A clinical diagnosis of possible septicemia and pneumonia was made at that time. The child was given oxygen and sulfadiazine but died a few hours later. A culture of his blood taken during lifetime revealed innumerable colonies of S. typhi murium. The pertinent conditions noted at autopsy were as follows: confluent bronchopneumonia of both lungs and hemorrhagic mucoid bronchitis of both major bronchi. The intestine showed no abnormality. The possibility of a respiratory origin of the bacteremia was not investigated by means of cultural examinations of the bronchi and the lungs.

8. Bornstein, S.: The State of the Salmonella Problem, J. Immunol. **46**:439 (June) 1943.

CASE 5.—A white boy was admitted to the Childr Hospital at the age of 5 months. The chief compl was a cough and difficult breathing. A diagnosis pneumonia was made during the stay at the hospi The temperature ranged from 36 to 44.5 C. (96.8 108.1 F.). Diarrhea developed, and up to twenty st were passed in twenty-four hour periods. In spite the administration of blood plasma, 5 per cent solut of dextrose in isotonic solution of sodium chlori sulfathiazole, sulfadiazine and succinylsulfathiazole, severity of the illness progressed, and the patient d four weeks after admission. The pertinent laborat findings were as follows: A leukocyte count vary between 14,000 and 43,000, S. typhi murium dem strated in five out of six fecal cultures, a positive action to the Widal test in a dilution of 1:250 agai the homologous strain and bacteriologically sterile c tures of the blood. Permission for postmortem exa nation was not obtained.

CASE 12.—An 11 day old white girl had a histo of severe jaundice. Diarrhea and fever developed the eleventh day of life. Cultures of the stools revea the presence of S. typhi murium. A culture of blood was sterile. The child died three weeks af admission to the hospital. The pertinent patholo conditions noted on postmortem examination we acute colitis with distention and superficial erosi recent peritonitis and recent bronchopneumonia. T source of the infection could not be determined.

Because infections due to S. London, S. U bana, S. Derby and Salmonella anatis are n common in infants, a summary of representati cases is herewith presented.

CASE 17.—A 5 month old infant was admitted to t hospital because of diarrhea and infection of the upp respiratory tract. Frank blood was present in t watery, greenish feces. The patient's temperature w 38.9 C. (102 F.). A clinical diagnosis of dysente was made. His temperature rose to 39.5 C. (103.1 F and the diarrhea persisted. From the third day af admission the temperature was normal; the diarrh stopped, and the infant began to gain weight. The patie was discharged one week after admission. S. Urbe was isolated from feces of this patient.

CASE 18.—A 16 day old white girl was admitted the hospital because of diarrhea. The stools we watery and greenish but did not contain blood or muc The child vomited repeatedly. On her admission diagnosis of diarrhea and marked dehydration was ma The temperature of the child during hospitalizati varied between 36.2 and 40 C. (97.16 and 104 F The infant was given 5 per cent dextrose in isoto solution of sodium chloride intravenously. The diarrh persisted, five to seven stools being passed in twent four hour periods. The temperature, however, return to normal. Two specimens of feces obtained duri hospitalization revealed the presence of S. London. T source of infection could not be determined. The patie was discharged for treatment by a private physician.

CASE 19.—An 8 week old white boy was admitt to the hospital because of convulsions. His temperatu on admission was normal. There was no diarrh The level of blood calcium on his admission was 6 m per hundred cubic centimeters. One week later diarrh developed, up to ten stools being passed daily, and t patient's temperature rose to 39.8 C. (103.6 F.). The was no blood in the feces. Conservative treatm resulted in recovery from the diarrheal disease. A c

e of the stool revealed the presence of S. anatis. e mother of the child did not harbor this organism her stool.

CASE 20.—A 7 month old white boy had diarrheal ease which resulted in marked dehydration. Up to e stools were passed in twenty-four hour periods. ood was not present in the feces. The temperature ched 39.2 C. (102.6 F.) The child was given cinylsulfathiazole. One week later the temperature urned to normal and the diarrhea subsided. S. Derby s present in the feces over a period of more than e weeks. It is interesting that for three weeks the ld (weighing 21 pounds [9,525 Gm.]) received as ch as 9 Gm. of succinylsulfathiazole per day and t this treatment failed to eliminate the Salmonella ganisms from the intestinal tract and there was almost reduction in the number of coliform organisms in feces.

COMMENT

Infections due to salmonella in infants occur th epidemically and sporadically. Clinical anifestations are of several different forms:) paratyphoid, resembling typhoid and also ferred to as salmonella fever; (2) septicemia d bacteremia, often associated with purulent sions, such as arthritis, osteomyelitis, meningitis d others; (3) gastroenteritis, enterocolitis and od poisoning.

Incidence.—The 20 cases of sporadic infections e to Salmonella in infants under 1 year of age ported in this communication present several atures worthy of discussion. Since the cases ere observed over a period of approximately ree years, it is evident that sporadic salmonel- sis of infants is not a very rare disease in this rt of the country. At this hospital infections e to Salmonella have greatly exceeded infec- ons due to Shigella during the last few years. he true incidence of salmonellosis is not known. part this is due to the fact that adequate cteriologic examinations are not always carried t. It should be noted that infections due to any types of Salmonella are not reportable in me localities, for example, in the state of New ork. That a definite need for more information the incidence of Salmonella infections in man ists cannot be doubted.

Clinical Features.—The main clinical syn- omes encountered in the 20 cases of sporadic fections due to Salmonella in infants were as llows: gastrointestinal disorders (gastroenter- is, enterocolitis, diarrheal disease), 17 cases; pticemia or bacteremia due to Salmonella, 2 ses. Severe hemorrhagic enterocolitis was und on postmortem examination in 1 of the cteremic infants; in the other, intestinal lesions ere absent.

In the 2 remaining cases it is doubtful whether e presence of Salmonella organisms in the testinal tract had any relation to the clinical anifestations. In 1 of these cases the patient had an infection of the upper respiratory tract of unknown cause; in the other there was a feeding problem. It is likely that these patients were carriers of Salmonella organisms, particularly since there was neither evidence nor history of diarrheal disease.

Hormaeche and his associates[4] offered the following classification of Salmonella infection of the intestinal tract: (1) salmonellosis associated with enteritis and (2) salmonellosis not associated with enteritis. The enteritis may be choleriform, dysenteriform or mixed. That the infection may produce a clinical picture of dysentery is borne out by case 17. This patient had fever and diarrhea; blood was present in the feces. S. Urbana was recovered from the stools.

Worthy of note is the observation that in 8 cases of salmonellosis of the alimentary tract inflammatory lesions outside of the intestine were also present, particularly infections of the upper respiratory tract, pneumonia and otitis media. Since a special search for Salmonella organisms in these lesions was not made, it is impossible to state whether or not these organisms were also responsible for the parenteral infection. It is conceivable that in some instances two concurrent diseases of different origin were present. It is also possible that the parenteral infection lowered the resistance of the patient and thus enabled the paratyphoid bacilli already present in the intestinal tract to produce the diarrheal disease. Further studies on the relationship of parenteral infections to diarrhea due to Salmonella in infants are needed.

Distribution.—So far as the distribution of the various types is concerned, S. typhi murium was encountered in 14 cases, S. paratyphi B in 2 and S. London, S. Urbana, S. Derby and S. anatis in 1 case each. For comparative purposes the data, collected by Bornstein, on the distribution of the various types of Salmonella in 500 cases of infection in human beings from North America and Cuba should be cited. S. typhi murium was encountered in slightly more than 30 per cent of the 500 cases. In the series reported here this type was found in 14 of 20 cases, or approximately 70 per cent. Bornstein encountered S. anatis in 2.6 per cent, S. Derby in 2.2 per cent and S. Urbana in 0.6 per cent of the cases and S. London not at all. Data on infections in infants caused by these rather unusual types have been included in the present paper. In all instances these organisms were responsible for diarrheal disease. S. Urbana caused a dysentery-like picture.

Therapy.—Four of 20 patients died; so it is evident that Salmonella infections in infants are not necessarily mild. Unfortunately, treatment

with sulfonamide compounds has not yielded encouraging results. Such drugs did not prevent a fatal outcome in 3 cases; so little can be said with respect to the efficacy of sulfonamide compounds in the treatment of sporadic infections of infants due to Salmonella. No hope can be placed in penicillin, since this drug seems to be ineffective against gram-negative enteric organisms. It is possible, however, that other antibiotic substances may be found which will be active against Salmonella.

The prevention of infections due to Salmonella becomes more important in view of the fact that effective specific therapy is not available at the present time. Unfortunately, little is known concerning the source of the infection in sporadic cases. Studies on this subject are needed.

SUMMARY

Clinical and bacteriologic data on 20 sporadic cases of infection due to Salmonella in infants (under 1 year of age) are presented. The pertinent observations were as follows:

Seventeen infants had infection of the intestinal tract due to Salmonella (gastroenteritis, enterocolitis and diarrheal disease). In 2 instances the paratyphoid bacillus was recovered from feces. One of the patients presented the clinical picture of dysentery. In 8 patients parenteral infections (pneumonia, otitis media and others) of undetermined cause were also present.

Two infants had bacteremia due to Salmonella. S. typhi murium was the invading organism. Both patients succumbed. One of them [illegible] severe hemorrhagic enterocolitis; the other [illegible] sented no evidence of intestinal disorder.

Two patients, respectively 3 weeks an[illegible] months old, were carriers of Salmonella: S. t[illegible] murium was recovered from feces.

The distribution of the 20 patients as to [illegible] was as follows: less than 4 weeks old, 3 infa[illegible] between 1 and 3 months, 4; between 3 an[illegible] months, 8, and between 6 and 12 months[illegible] Five infants were girls, and 15 were b[illegible] Eighteen were white, and 2 were Negro.

The following types of Salmonella were [illegible] countered: S. typhi murium in 14 cases, S. p[illegible] typhi B in 2 cases and S. Urbana, S. De[illegible] S. London and S. anatis in 1 case each.

Of the 20 infants 16 recovered and 4 d[illegible] Two of the infants who died had bacteremia [illegible] to S. typhi murium; the other 2 had infection[illegible] the intestinal tract due to S. typhi murium.

Fourteen infants were treated with sul[illegible] amide compounds, including sulfathiazole, su[illegible] diazine and succinylsulfathiazole. Of these[illegible] died and 11 recovered. There was 1 de[illegible] among 6 infants who did not receive sulfonam[illegible] compounds. These drugs failed to eliminate [illegible] Salmonella organisms from the intestinal tract[illegible] several instances.

Brief reports are presented of the fatal ca[illegible] and of those in which the infection was due[illegible] rather unusual types (S. London, S. De[illegible] S. anatis and S. Urbana).

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EMOLYTIC DISEASE OF THE FETUS AND THE NEWBORN INFANT

WITH SPECIAL REFERENCE TO TRANSFUSION THERAPY AND THE USE OF THE BIOLOGIC TEST FOR DETECTING RH SENSITIVITY

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The Rh factor of Landsteiner and Wiener [1] been shown to be related to about 90 per t of the reactions to intragroup blood trans- ion [2] and to about 90 per cent of the cases of throblastosis (hemolytic disease of the fetus of the newborn).[3]

n the typical case, the patient having a hemo- c reaction to an intragroup transfusion or the ther delivered of an erythroblastotic infant is nd to have Rh-negative blood. However, e only 1 in about 25 to 50 persons with such od is readily sensitized to the Rh factor, either transfusion or by pregnancy, the mere fact t the patient's blood is Rh negative is not of that the Rh factor is responsible for the hologic state. One must prove in addition t sensitization to the Rh factor has occurred.

From the Blood Transfusion Division and the De- ments of Pediatrics and Obstetrics of the Jewish pital.

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1. Landsteiner, K., and Wiener, A. S.: An Agglu- ble Factor in Human Blood Recognizable by Im- e Sera for Rhesus Blood, Proc. Soc. Exper. Biol. Med. **43**:223 (Jan.) 1940. Landsteiner, K., and ener, A. S.: Studies on an Agglutinogen (Rh) in man Blood Reacting with Anti-Rhesus Sera and Human Isoantibodies, J. Exper. Med. **74**:309 t.) 1941.

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3. Levine, P.; Katzin, E. M., and Burnham, L.: mmunization in Pregnancy: Its Possible Bearing the Etiology of Erythroblastosis Fetalis, J. A. M. **116**:825 (March 1) 1941. Burnham, L.: The Com- Etiology of Erythroblastosis and Transfusion Ac- nts in Pregnancy, Am. J. Obst. & Gynec. **42**:389 pt.) 1944. Levine, P.; Burnham, L.; Katzin, E. M., Vogel, P.: Role of Isoimmunization in the Patho- esis of Erythroblastosis Fetalis, Am. J. Obst. & ec. **42**:925 (Dec.) 1941.

TESTS FOR SENSITIVITY TO THE RH FACTOR

Tests in General Use.—The usual method of demonstrating Rh sensitivity is to test the patient's serum for anti-Rh agglutinins, as was first done by Wiener and Peters.[2] However, it was soon discovered that there is a high percentage of persons with Rh-negative blood who are highly sensitive to the Rh factor (as proved by the occurrence of hemolytic reactions to intragroup transfusion or by the birth of an infant with hemolytic disease) whose plasma does not contain any demonstrable anti-Rh agglutinins. These puzzling cases have been explained, at least in part, by the discovery that in addition to Rh antibodies that produce hemagglutination there are Rh antibodies characterized by their ability to combine specifically with Rh-positive cells without producing a visible reaction.[4] If Rh-positive blood is mixed with serum containing antibodies of the latter type, the blood loses its capacity to be agglutinated even by extremely potent anti-Rh agglutinating serums, presumably because all the combining sites on the erythrocytes have been occupied. Because of this property of blocking the action of anti-Rh agglutinins, the new type of antibody has been named the blocking antibody. The Rh-blocking antibodies appear to be of greater clinical significance than the agglutinating antibodies, and their discovery has served to explain the hitherto puzzling lack of correlation between the titer of anti-Rh agglutinins and the severity of the disease in the infant. Thus, severe or fatal icterus gravis has occurred although the maternal serum contained no demonstrable anti-Rh agglutinins, and at least 1 case [5] has been reported in which a mother with Rh-negative blood whose serum contained anti-Rh agglutinins in high titer gave birth to a normal infant with Rh-positive blood.

4. Wiener, A. S.: A New Test (Blocking Test) for Rh Sensitization, Proc. Soc. Exper. Biol. & Med. **56**:173 (June) 1944.

5. Dockeray, G. C., and Sachs, H.: Rh Antibodies in the Maternal Circulation Without Clinical Manifestations of Erythroblastosis in the Child, J. Immunol. **48**:213 (April) 1944.

The Biologic Test for Sensitivity.—A third method of detecting Rh sensitivity, namely, a biologic test, was described by one of us (A.S.W.[6]) in 1942. This test has proved particularly useful for the prevention of hemolytic reactions to intragroup transfusion in the absence of the facilities or the time for carrying out tests for the Rh factor. The biologic test consists of intravenous injection of 50 cc. of blood to which the patient may be sensitive and comparison with the naked eye of the color of the patient's original citrated plasma with that of a comparable specimen taken one to one and one-half hours after the injection. If sensitivity is present, the second sample of plasma will be distinctly darker and not infrequently the patient will have a chill fifty to sixty minutes after the test is started, followed by a rise in temperature. In case of doubt an additional 50 cc. of blood may be injected and a third specimen of the patient's plasma obtained for comparison after one more hour. If the reaction to this test is negative, any quantity of blood from the same donor can be given without untoward effect.

The purpose of the present paper is principally to describe some experiences with the application of the biologic test for the detection of sensitivity to the Rh factor caused by pregnancy and at the same time to present some recent observations on the transfusion therapy of hemolytic disease of the newborn.

REPORT OF CASE

CASE 1.—*Obstetric History.*—A couple gave the following obstetric history:

First pregnancy (1937), abortion at one month.

Second pregnancy (1938), normal female child.

Third pregnancy (1940), full term child, normal except for asthma, eczema and hives.

Fourth pregnancy (1941), abortion at two months.

Fifth pregnancy (1942), 3½ month fetus which underwent hydatidiform degeneration.

Sixth pregnancy (1942), miscarriage at four and one-half months.

This couple was extremely anxious to have more children, and the wife had taken courses of progesterone and thyroid. Throughout the sixth pregnancy she had remained in bed.

Results of Grouping Tests.—The referring physician suggested that the Rh factor might be related to the abortions, and tests of the blood yielded the following information:

Blood of	Group and Subgroup	Rh type[7]
Husband	A_1	Rh_2
Wife	A_1	Negative

Results of Biologic Tests.—Because the wife's b was Rh negative, the referring physician felt sensitization to the Rh factor had probably occu However, in the experience of the authors and of other workers, the Rh factor is not related to abortions. Rh isoantibodies could not be demonstr in the woman's serum, but, as has already been tioned, this fact does not necessarily rule out tivity; so further studies were deemed necessary.

Accordingly, 50 cc. of the husband's blood was m with 100 cc. of isotonic solution of sodium chl and slowly injected into a vein of the wife by gravity method. There was no reaction of any to the procedure, and the wife's plasma one hour the transfusion was no darker than the plasma drawn before the transfusion, indicating that no he ysis had occurred. This result proved that the wo was not sensitive to the Rh factor and that the repe early abortions had a cause other than isoimmuniz

CASE 2.—*Obstetric History.*—A man of 48 years a woman of 35 years, who had been married for years, gave the following obstetric history:

First pregnancy (1937), full term stillbirth, attrib to a knot in the umbilical cord.

Second pregnancy (1939), induced abortion in third or fourth month.

Third pregnancy (1941), full term infant who after thirty-six hours. Death was attributed to pre ture separation of the placenta with resulting cere anoxemia and irremediable damage to the brain. nurse had called the physician's attention to the extr pallor of the infant one hour before death. No ja dice was noted at any time.

Fourth pregnancy (1942), premature stillbirth in seventh month. An autopsy was performed, but th no light on the cause of death.

Results of Grouping and Rh Tests.—Tests had b made for the Rh factor: The husband's blood found to be Rh positive and the wife's Rh nega We were requested to give the prognosis for fu pregnancies, because the couple was anxious to h a child.

Complete serologic tests gave the following in mation:

Blood of	Group and Subgroup	MN Type	Rh T
Husband	A_1	MN	Rh_1 R
Wife	O	N	Nega

No anti-Rh agglutinins could be detected in the w serum, but the obstetric history was so suggestive we felt that the woman was nevertheless sensitize the Rh factor.

6. Wiener, A. S.: Blood Groups and Transfusion, ed. 3, Springfield, Ill., Charles C Thomas, Publisher, 1943, p. 71.

7. The Rh-positive type includes a number of distinct varieties of blood, because of the existence of more than one kind of Rh factor. Five principal varieties have been identified; they are designated as Rh_1, Rh_2, Rh_0, Rh′ and Rh″. According to the theory p posed by A. S. Wiener (Genetic Theory of Rh Bl Types, Proc. Soc. Exper. Biol. & Med. **54**:316 [D 1943), these Rh factors give rise to eight Rh bl types (phenotypes), which are inherited through series of allelic genes, Rh_1, Rh_2, Rh_0, Rh′, Rh″ and each gene being named for the property which it de mines. For full details consult the following pape Wiener, A. S.; Sonn, E. B., and Belkin, R. B.: Her ity of the Rh Blood Types, J. Exper. Med. **79**: (March) 1944. Wiener, A. S.: Nomenclature of Rh Blood Types, Science **99**:532 (June 30) 1 Race, R. R.; Taylor, G. L.; Cappell, D. F., McFarlane, M. N.: Recognition of a Further C mon Rh Genotype in Man, Nature, London **153** (Jan. 8) 1944.

esults of Biologic Test.—To settle the question defi- y a biologic test was done. Fifty cubic centimeters roup O, Rh_1 Rh_2 blood from a professional donor [8] injected into a vein of the woman by syringe. hin fifty minutes the patient experienced a slight iness, which became a definite chill in another en minutes. Blood plasma procured at this time noticeably darker than that obtained before the tion. (The icterus index had risen from 4 to 6 s.) The chills continued intermittently for an- r hour, and the patient complained of faintness. e she had not eaten for five hours, she was given lass of orange juice, which she vomited. She plained of abdominal cramps and fainted on at- ing to go to the bathroom. She was readily ved, but her blood pressure at this time was only mm. systolic. An intravenous infusion of 250 cc. 0 per cent dextrose in isotonic solution of sodium ride mixed with 50 cc. of 3 per cent sodium citrate rapidly administered, and at the same time another ple of blood was withdrawn. The icterus index by now risen to 8 units. After the intravenous sion and a hypodermic injection of 5 minims cc.) of 1:1,000 solution of epinephrine hydro- ride the patient felt markedly improved, and after king a cup of black coffee she felt well enough eave the office.

The positive reaction to the biologic test ved that the patient was sensitive to the factor, despite the absence of demonstrable antibodies in her serum. It is significant that ample of her serum obtained one week after biologic test was found to contain blocking bodies but no demonstrable anti-Rh agglu- ns. Since the husband's blood belongs to e Rh_1 Rh_2, this couple can have only children h Rh-positive blood (presumably half of them h type Rh_1 and half with type Rh_2). Except he unlikely event of spontaneous desensitiza- , there is no chance of a normal infant's re- ing from this mating.

The severity of the symptoms which the pa- t in this case experienced after the injection 50 cc. of Rh-positive blood convinced us that following precautions are advisable when logic tests are being performed: First the test uld, if possible, be carried out in a hospital. cond, when the clinical history suggests that rked sensitivity may be present, the test dose uld be given well diluted with isotonic ution of sodium chloride and should be ad- inistered by the drip rather than by the syringe thod. If one desires to be extremely cautious, ctional doses given over a period of one to hours may be used.

ASE 3.—*Obstetric History.*—The patient had had preceding pregnancy, two years previously, which ulted in a full term male infant delivered by cesarian ion. The section was necessary because of pelvic disproportion and an incipient Bandl ring. This baby appeared normal at birth, but at 5 days anemia, hepatomegaly and splenomegaly were noted. Blood studies showed a red blood cell count of 1,900,000 cells with 58 per cent hemoglobin, and there were occasional normoblasts on the smear. The infant was given four transfusions, totaling 260 cc. of blood, over a period of two weeks, but when he was discharged his hemoglobin was still only 50 per cent and the red cell count 2,700,000. No account was taken of the Rh factor in selecting the donors for the transfusions. At home the infant was given hepatic therapy, and he gradually improved. At the time of writing he was entirely normal.

The mother was referred for study because she was pregnant again and near term, and it was felt there was a high probability that the new infant would also have hemolytic disease.

Results of Grouping Tests.—Blood tests of the family showed the following:

Blood of	Group	MN Type	Rh Type
Father	O	MN	Rh_1
Mother	O	N	Negative
Son (2 years old)	O	MN	Rh_1

Prognosis.—Although no anti-Rh agglutinins could be demonstrated in the maternal serum, these findings supported the diagnosis of erythroblastosis in the first child and made it probable that the expected infant would also have hemolytic disease.[9] It was planned to deliver the infant by cesarian section, and arrangements were made to give the infant a complete exsanguination transfusion with Rh-negative blood as soon as it was born.

Procedures.—On the morning chosen for the operation, a biologic test was performed on the mother by injecting 50 cc. of her husband's blood intravenously. After fifty minutes, the patient had a severe chill lasting twenty minutes, and a sample of her blood plasma taken at that time was distinctly darker than the plasma obtained before the injection. This confirmed the impression that the patient was sensitive to the Rh factor. Rh-negative, group O blood[10] was then drawn from a donor in preparation for the exsanguination transfusion.

As soon as the infant, a girl, was delivered through the incision, it was noticed that she was extremely pale, rather than icteric, and seemed listless. A blood count was ordered at once, but before the technician had time to arrive the baby's condition became noticeably worse. Her breathing became shallow and rapid; she did not respond to strong stimuli, and within a few moments she appeared moribund. Since all the apparatus and the blood were at hand, a transfusion was started at once with the aid of a syringe-valve set. Eighty cubic centimeters of blood was administered rapidly, and the infant's color and her condition improved dramatically. The hemoglobin was deter-

8. The husband could not be used because his blood of an incompatible group. Care was taken to use rofessional donor with blood of the same Rh type hat of the husband.

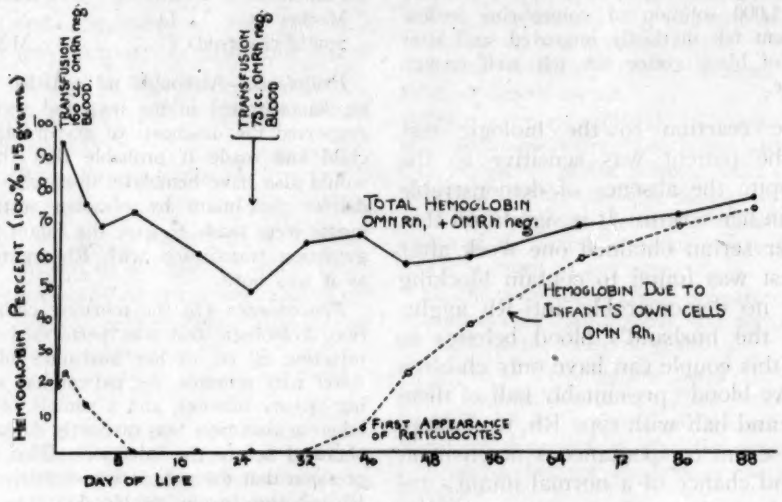
9. Unfortunately no anti-Hr (St) serum was available at the time these tests were made. As R. R. Race and G. L. Taylor (A Serum That Discloses the Genotype of Some Rh-Positive People, Nature, London **152**:300 [Sept. 11] 1943) pointed out for the first time, if blood of a type Rh_1 parent reacts negatively with a strong St serum he or she cannot have Rh-negative children.

10. In this case we knew that the infant's blood would belong to group O because that of both parents belonged to group O.

mined at this time and was found to be only 50 per cent; this indicates that before the transfusion it must have been less than 20 per cent. An additional 80 cc. of blood followed by 5 cc. of 10 per cent solution of calcium gluconate was injected (to counteract the relatively large amount of citrate given). The infant when sent to the nursery was in excellent condition.

Grouping tests on blood obtained from the umbilical cord showed that the infant's blood belonged to group O, type MN and type Rh_1.

The infant's subsequent course was interesting. Considering that the baby weighed 8 pounds and 3 ounces (3,714 Gm.) and therefore had a blood volume of approximately 240 to 250 cc., the 160 cc. of Rh-negative blood transfused would be expected to maintain her hemoglobin level at about 60 to 65 per cent, even if all her own blood cells were destroyed. During the first twenty-four hours the hemoglobin level actually ranged between 90 and 100 per cent. Within forty-eight hours the hemoglobin had dropped to 77 per cent; it was still above 70 per cent when the infant was discharged on the tenth day. The infant was followed


TRANSFUSION 160 cc. OMRh neg. BLOOD.
TRANSFUSION 75 cc. OMRh neg. BLOOD
HEMOGLOBIN PERCENT (100% = 15 grams)
TOTAL HEMOGLOBIN OMN Rh, + OMRh neg.
HEMOGLOBIN DUE TO INFANT'S OWN CELLS OMN Rh,
FIRST APPEARANCE OF RETICULOCYTES
DAY OF LIFE

Results of differential agglutination tests in case 3.

up at home, where it was observed that her gain in weight was poor and that progressive pallor developed. When she was 1 month old, her hemoglobin had dropped to 50 per cent, and it was necessary to give another transfusion of 75 cc. of Rh-negative blood. After the transfusion the hemoglobin rose to 67 per cent. The hemoglobin then fell slightly, but within a short time it rose again. At the time of writing the infant was 3 months old and thriving, her hemoglobin being above 75 per cent.

The results of the differential agglutination tests[11] were illuminating (see chart). On the first day, after the initial transfusion of 160 cc. of Rh-negative blood had been given, three fourths of the 95 per cent hemoglobin could be attributed to the donor's blood and only one fourth to the patient's own blood. It will be seen that the initial drop in hemoglobin w occurred in the hospital was due to the elim tion of the last remnants of the infant's own and that for a period of a month the only b detectable in the infant's circulation was tha ceived from the donor. Then, finally, the ferential agglutination test revealed the pearance of the patient's own type of b gradually replacing the donor's erythrocyte they disappeared from the circulation. (currently, reticulocytes made their appearanc the blood smears.) It was not until more two months after the last transfusion that a the donor's blood had been eliminated from infant's body.

The question arises why there was no trac the patient's own blood in her circulation as long a period as one month. It may be

the anti-Rh isoantibodies of the mother damaged the erythropoietic tissue of the in so that transient aplastic anemia developed the latter. Or perhaps the infant's body tained an excess of Rh isoantibodies w destroyed her Rh-positive blood as quickly it was released into the circulation, this pro continuing until all the Rh isoantibodies w exhausted. In either event the transfusions t the infant over until its own blood became a able to the circulation.

As has already been mentioned, no anti agglutinins had been found in the mother's b before delivery, but studies of the mate serum after the cesarean operation yielded i esting results.[12] A sample of serum obta one week after delivery revealed the presenc anti-Rh agglutinins of high titer (128). H ever, one month later agglutinins were no lo

11. For a description of the technic see Wiener, A. S.: Hemolytic Transfusion Reactions: I. Diagnosis with Special Reference to the Method of Differential Agglutination, Am. J. Clin. Path. **12**:1889 (April) 1942.

12. These are presented in detail elsewhere.[4]

onstrable in the serum. Tests of the serum ined at this time showed that it contained -Rh blocking antibodies, the titer of these g between 2 and 4. It is interesting to ulate whether the evanescent appearance of nt anti-Rh agglutinins in our patient's m was the result of the provocative dose h-positive blood given in the biologic test.

SE 4.—*Obstetric History.*—This patient, who was nant for the fourth time and was near term when seen, gave the following obstetric history:

rst pregnancy, normal full term male, who is now ars old.

cond pregnancy, miscarriage at ten weeks.

ird pregnancy (a few years before the present erythroblastotic infant who died after four days.

sults of Grouping Tests.—Grouping tests of the nts and of the surviving child showed:

d of	Group and Subgroup	MN Type	Rh Type
er	A_2B	MN	$Rh_1\,Rh_2$
ner	A_1	MN	Negative
(9 years old)	A_1	M	Rh_2

ognosis.—In spite of the fact that no anti-Rh agnins could be demonstrated in the maternal serum, serologic findings supported the diagnosis of roblastosis in the last child. Although the first 's blood was Rh positive, he had escaped, probably use a sufficient degree of sensitivity had not develduring the period of gestation. Since the hus-'s blood belonged to type Rh_1Rh_2, it was to be cted that every child would have Rh-positive blood would be subject to the disease.

ocedure.—When the patient reached term and went labor, preparations were made to give the expected t an exsanguination transfusion as soon as it was From the parents' blood groups, it was clear the expected child had to have blood of group A, AB and could not have group O blood. Arrangeswere made to have Rh-negative donors of these groups at hand. The patient delivered an 8 d (3,629 Gm.) female infant, who appeared robust normal except for a slight bronzing of the skin. d was taken from the umbilical cord, and while as being tested in the laboratory a biologic test performed on the mother. Fifty cubic centimeters lood of group A, type Rh_1Rh_2 was injected intrausly. Within thirty-five minutes a severe chill loped, which was followed by a rise in temperature. d drawn during the chill showed the presence of globinemia, which proved that the mother was d sensitive to the Rh factor. In the meantime, ping tests on the blood from the cord showed that infant's blood belonged to group A and was Rh ive. (Subsequent tests proved that the blood of nfant belonged to group A, type N and type Rh_2. ars of the blood from the cord stained later showed rous erythroblasts in every field, and the cord n had an icterus index of 45. There was no evie of anemia, however.) In view of the mother's ive reaction to the biologic test and the finding the infant's blood was Rh positive, blood was n from the donor with group A, Rh-negative d. Fifty cubic centimeters of this blood was trans- to the infant through an incision into the internal enous vein. An attempt to withdraw blood through mbilical cord was unsuccessful because the vessels already become thrombosed and did not bleed even when cut in several places. By various avenues, namely, the anterior fontanel and both deep femoral veins, a total of only 50 cc. of the infant's blood could be withdrawn. An additional 70 cc. of the donor's blood was then administered. While at first we had planned to carry out a complete exsanguination transfusion, the procedure was discontinued at this point because of the difficulties encountered and the fact that the infant looked so well that no further treatment seemed necessary.[13]

Course.—For the first three days after birth the baby appeared perfectly well, and the hemoglobin ranged from 95 to 100 per cent, with the red blood count averaging about 5,000,000. The only disturbing factor was the persistence of icterus. On examination of the urine, no bile was found, indicating that the bile was not being excreted by that route. (In comparable cases previously observed, the urine was usually deeply bile stained, the elimination of bile being accompanied by clearing of the clinical jaundice.) On the evening of the third day there was a slight rise in temperature; the infant became lethargic and refused his feeding. Splenomegaly and hepatomegaly were present, and on the morning of the fifth day the infant died. A sample of blood obtained before death had an icterus index of only 22. In an autopsy performed by Dr. David M. Grayzel enlargement of the liver and of the spleen, generalized icterus and kernicterus were the principal gross abnormalities noted.

A sample of the mother's blood obtained about a month after delivery showed anti-Rh agglutinins with a titer of 16.

This case demonstrates that blood transfusion is not the complete answer to the problem of the treatment of hemolytic anemia of the newborn, even when the infants appear to be in good condition at birth. Transfusions are merely a substitution therapy, and therefore save only those infants who would otherwise die from the extreme anemia brought about by the destructive action of the maternal isoantibodies. Hemolytic anemia is not, however, the sole mechanism of death in this disease. Some infants will not suffer a marked drop in the amount of hemoglobin but still may succumb to the lethal effects of retaining the products of hemolysis in their bodies, and a few die of hemorrhagic diathesis, which does not appear to be influenced by simple transfusion of Rh-negative blood or by administration of vitamin K. It is theoretically possible that when an infant's blood is susceptible to the action of Rh antibodies a complete exsanguination transfusion, entailing the removal of all but a small quantity of the infant's blood and its replacement by Rh-negative blood at

13. In a subsequent experiment, performed on a premature mongolian idiot weighing only 4 pounds (1,814 Gm.), we were able to effect a 90 per cent substitution of the infant's blood with donor's blood (as proved by differential agglutination tests). To accomplish this, it was necessary to withdraw as much as 275 cc. of blood from the infant and concurrently to inject a like amount of donor's blood, although the calculated blood volume of the infant was only 150 cc.

birth or as soon thereafter as possible may serve to prevent a lethal outcome. One must keep in mind when treating such infants that occasionally mental deficiency (as a result of kernicterus) or cirrhosis of the liver[14] may remain as a sequela after the immediate threat to life has been overcome by blood transfusion. Fortunately all of the infants whose lives we have saved by blood transfusion (10 in number[15]) have developed into apparently normal children.

A question which remains unanswered is why some infants with a severe degree of hemolysis have deep jaundice which clears within a few days without any harmful after-effects, while in others with a lesser degree of hemolysis and with slight jaundice the icterus persists to the detriment of the patient. As is suggested in our case report, excretion of bile by the kidneys appears to be an important factor. A second factor, more difficult to assess, may be the efficiency of the liver in the elimination of bile. Further study of this problem is urgently needed.

COMMENT

The final proof or disproof of intragroup sensitivity is the result of the biologic test. This is true not only in the more common case in which the patient's blood is Rh negative, but also in the rarer one involving a patient with Rh-positive blood.

The two principal applications of the biologic test are: (1) as a precautionary measure before blood transfusions and (2) as a means of detecting isoimmunization in pregnancy, for example, in pregnancies resulting in stillbirths or miscarriages the cause of which is obscure. The first 2 cases of the present paper illustrate the second application. In case 2 it was proved that the stillbirths were caused by sensitivity to the Rh factor; in fact, the patient's reaction to the test dose of 50 cc. of Rh-positive blood was so violent that we now are hesitant about applying the test again merely as a routine diagnostic procedure. The recent discovery of the blocking Rh antibodies fortunately makes possible a relatively simple in vitro test for Rh sensitivity which largely does away with the need for the biologic test in such cases. The main field of usefulness for the biologic test is, we feel, as a preliminary to blood transfus particularly post partum.

In emergencies such as severe postpar hemorrhage or shock following a cesarean op tion the possibility of Rh isoimmunization by fetus must always be borne in mind; so we h adopted the following procedure in order to pedite transfusions to such a patient: A sam of the patient's blood is drawn and sent to laboratory for tests of blood grouping and the Rh factor. Through the same needle 50 of group O blood from an intern or a nurs injected (this is usually and preferably Rh p tive). Without the needle's being withdr from the vein infusion of plasma or of isot solution of sodium chloride is started. T infusion will not interfere with the results of biologic test and will maintain the patient's bl pressure during the hour that one must wait the result of the test. After one to one and half hours, a second sample of blood is obtai and the serum or plasma separated from sample is compared with the first serum. the result of the test is negative the patient be given any amount of blood from the s donor. If Rh-positive blood was used for test, the Rh type of any additional donors be disregarded. A negative result of the biol test obtained in this way from a patient Rh-negative blood leaves the transfusionist to use blood of any compatible group, Rh p tive as well as Rh negative, without dange a transfusion reaction caused by Rh incom ibility. Were no information available than the fact that the patient's blood is Rh n tive, only Rh-negative blood could be used such transfusions, a requirement which w sharply limit the choice of donors. This sideration is of some importance in these ca since as much as a liter or even 2 liters of bl or more is required in many cases of postpar hemorrhage. Patients with Rh-positive bl will hardly ever offer any problems in the s tion of donors.

The procedure outlined for transfusion postpartum patient has the advantage that time is lost. While waiting for the results the serologic test the patient is receiving pla or saline solution, and by the time the hou past grouping and Rh tests will have been c pleted and enough information will be on h for safe conduct of further transfusion. I dentally, the direct in vitro matching test Rh sensitivity is not entirely reliable.

With regard to the therapy of the infant case 3 is probably the most dramatic thus reported as an example of the life-saving v

14. Parsons, L. G.: Haemolytic Disease of the Newborn, Correspondence, Brit. M. J. **1**:371 (March 11) 1944.

15. Wiener, A. S., and Wexler, I. B., Transfusion Therapy of Acute Hemolytic Anemia of the Newborn, Am. J. Clin. Path. **13**:393 (Aug.) 1943. Wiener, A. S.: The Role of the Subtypes of Rh in Hemolytic Transfusion Reactions and in Erythroblastosis, ibid. **14**:52 (Jan.) 1944.

Rh-negative blood. In fact, if the donor's
od had not been drawn before the infant was
n, ready to be administered at a moment's
ce, the infant's life would probably have been
, since it is doubtful that she could have
ived more than half an hour after birth.
eems probable that in view of the low hemo-
in content of the infant's blood and the con-
ation of hemolysis she would have been still-
n had the cesarean section been performed one
later. However, we do not consider this
an argument in favor of early cesarean sec-
. Such procedure would increase the hazard
he childbirth for the mother and also for the
nt on account of prematurity, and neither
hese disadvantages is balanced by the remote
nce of saving the infant from the action of the
ernal isoantibodies. We do feel, that when a
nan with Rh-negative blood gives a history
aving had an erythroblastotic baby and the
logic tests indicate that the child about to
orn will have Rh-positive blood and there-
be subject to hemolytic disease, preparations
transfusion immediately after birth are in-
ted.

SUMMARY

The biologic test was employed for the detection of sensitivity to the Rh factor. In a woman who had previously had repeated miscarriages, a negative biologic reaction proved that these were not caused by Rh sensitivity, even though her blood was Rh negative and her husband's was Rh positive. On the other hand, in a case involving a husband with Rh-positive blood and a wife with Rh-negative blood, who had had two stillbirths of obscure cause, a positive biologic test proved that isoimmunization was responsible, even though in vitro tests for anti-Rh agglutinins in the woman's serum had previously given negative results.

Two cases of hemolytic disease of the newborn are described in which the patients were treated by transfusions of Rh-negative blood. In 1 case the therapy was dramatically life-saving, while in the second, in which the disease was apparently milder, the infant died of cholemia and kernicterus.

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Case Reports

ABSCESSES OF THE LUNG IN A PREMATURE BABY

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Pulmonary abscess undoubtedly occurs much more frequently in children than is commonly supposed, but it is frequently missed because it is difficult to detect it in children and especially in infants. Baron [1] in 1908 reported an instance of abscess of the lung complicating otitis media in a child 2 weeks of age. He was able to collect from the literature 7 other cases of pulmonary abscess in infants. In the other 7 cases the diagnosis was not made ante mortem, whereas in his case the diagnosis was made after aspiration of the lung. Lilienthal [2] reported a successful operation on a patient three weeks after birth, and Struthers [3] reported an instance of pulmonary abscess in a boy aged 24 days.

The most important causes of pulmonary abscess in children are antecedent pulmonary infections and operations, especially tonsillectomies. Authorities disagree as to the incidence of pulmonary abscess following tonsillectomy. According to Moore [4] the incidence is 1 instance of pulmonary abscess per 3,000 tonsillectomies, whereas Keiper [5] stated that pulmonary abscess occurs once in every 780 tonsillectomies. The variation in the reports from different clinics is probably due to differences in technic. The relative frequency of post-tonsillectomy pulmonary abscess is not realized by a good many otolaryngologists because frequently the patient does not return to the physician who removed the tonsils, but consults the family physician, who may or may not consider the relationship between the tonsillectomy and the pulmonary symptoms which follow it.

A large number of micro-organisms have b obtained from pulmonary abscesses in child Smith [6] expressed the view that 75 per cen the bacterial abscesses and 50 per cent of abscesses in children are due to staphyloco In a series of 16 cases from the Graham Cli Ermatinger [7] found hemolytic Staphyloco aureus in 80 per cent. In other cases repo many other organisms have been found, such hemolyticus viridans and nonhemolytic strep cocci, Micrococcus catarrhalis, influenza ba and others. Rarely pneumococci may be cause of pulmonary abscess in children. (recently has the importance of Vincent's ganisms in the production of abscess of the l been recognized, although the association long been known.

The location of pulmonary abscesses va in the different groups studied. Singer Graham [8] in a study of 34 cases found 85 cent of the abscesses in the right lung and per cent in the lower lobe of the right l Clerf,[9] in studying a series of 77 persons of ages with abscess of the lung who were exam bronchoscopically, found the right lung invo in 62 per cent and the left lung in 28 per c The predominance of involvement of the lo lobe of the right lung in pulmonary abs following aspiration of foreign bodies is undo edly due to the more direct continuation of right main bronchus of the trachea.

The symptoms and signs of pulmonary abs in infants and children are not so character as in adults, and hence diagnosis is more d cult. The chief source of difficulty is that c dren, especially younger ones, seldom if expectorate the characteristic sputum whic so frequently of importance in the diagnosi

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7. Ermatinger, L. H.: Microorganisms of Abscess and Bronchiectasis, J. Infect. Dis. **43**:391,

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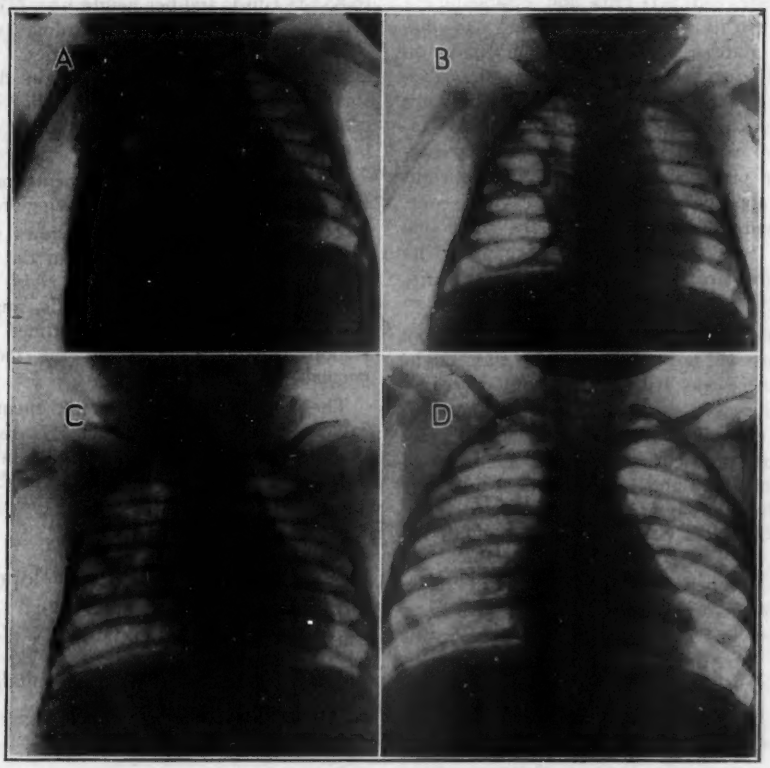
9. Clerf, L. H.: Pulmonary Abscess Follo Tonsillectomy: Bronchoscopic Considerations, Otolaryng. **11**:192 (Feb.) 1930.

monary abscess. The physical signs, espe-
ly in children and infants, are relatively few.
lor and anemia are early manifestations. A
inished percussion note is the most important
racic sign. Pulmonary dulness may be the
y evidence of abscess, the signs being those of
umonia or consolidation of the lobe rather
n of cavitation. Limitation of motion on
affected side is likely to occur in young
dren. The usual signs of cavitation, such as
rackpot percussion note and amphoric breath-
, are usually not found in children. In most
ances leukocytosis is present: The count

REPORT OF A CASE

The baby (M. R.), a girl, was born Jan. 3, 1942, six weeks prematurely, and weighed 5 pounds (2,268 Gm.) at birth; the delivery was normal. The baby was given a mixture of evaporated milk, water and corn syrup and seemed to be taking this diet fairly well and to be thriving.

On March 19, 1942, at the age of 10 weeks, the baby was seen by one of us (M. H.). She had had an intermittent fever for about one week and had a nonproductive cough. At this time her temperature was 101 F.; slight dulness to percussion and decreased breath sounds were noted over the right side of the chest. Fine crepitant rales were heard in the right axilla. Administration of sulfathiazole (8 grains [0.52 Gm.] daily) was started. On March 20 the baby's



Roentgenograms of the chest taken March 28 (*A*), April 19 (*B*), June 23 (*C*) and December 27 (*D*).

y be as high as 30,000 to 40,000. Because
physical findings are frequently of little
ue, roentgenograms are particularly valuable
the diagnosis of pulmonary abscess in young
dren. In infants, because of the early exten-
n of the process to the pleura with the de-
opment of empyema, the primary condition
ikely to be overlooked. Pulmonary abscess
uld be suspected in all cases of empyema in
dren, although empyema occurs more fre-
ntly than pulmonary abscess.

We had the opportunity of seeing a 10 week premature baby who had three abscesses in right lung.

temperature was 101.2 F., the cough had increased a little in frequency and again the breath sounds were decreased over the right side of the chest. On March 22 the baby had an attack of coughing that lasted for about twenty minutes. The cough was short and irritative, and it was so frequent that the baby had to be held by the mother, as at times she could not get her breath; nothing seemed to be able to relieve the coughing spasm. At this time the dulness was marked over the right side of the chest, and the breath sounds were much decreased.

Because of the severe coughing spasm and the physical findings the baby was taken to Locust Mountain Hospital, Shenandoah, Pa., and there the chest was aspirated by one of us (W. L.). The needle was inserted in the right side of the chest at about the posterior axillary line, and 20 cc. of thick, creamy pus was removed. On culture it was found to contain staphylococci. After

the aspiration the cough stopped, and the baby seemed to be in fairly good condition.

On March 24 her temperature was 98 F. in the morning; it rose to 101 F. in the latter part of the afternoon and was down to 98 F. again at midnight; there was no cough, but the dulness and the decreased breath sounds were still present over the right side of the chest.

On March 28 another coughing spasm similar to the one on March 22 occurred, and again the baby coughed persistently for about fifteen minutes without any relief. The chest was then aspirated for the second time, and 30 cc. of creamy pus was obtained, which seemed thicker in consistency than that aspirated previously. The blood count on March 28 showed: hemoglobin 56 per cent, red blood cells 2,240,000 and white blood cells 14,900 with polymorphonuclears 66 per cent, lymphocytes 33 per cent and eosinophils 1 per cent. Administration of sulfathiazole was discontinued on this date. A roentgenogram made on March 28, after the second aspiration, was described by the roentgenologist as follows (fig. *A*): "The right side of the chest presents a rather unusual appearance. There is apparently little if any accumulated fluid or pus present. But the entire right side of the chest appears as three large cavities—one, the largest, occupying the lower half of the right side of the chest and two smaller cavities occupying its upper half. All three are surrounded by a rather dense wall. The left lung is clear."

On March 30, two days after the second aspiration, the temperature was still normal. The baby was coughing slightly, and there was still dulness with decreased breath sounds in the right side of the chest. The child looked better and was taking her formula well, supplemented with 25 mg. of ascorbic acid and 10 drops of percomorph liver oil daily and ½ teaspoon of an elixir of ferrous sulfate twice a day. At this time she weighed 8 pounds 10 ounces (3,912 Gm.). The baby continued to do well.

On April 19 a second roentgenogram was taken (fig. *B*), which was described as follows: "There is no evidence of fluid or pus in the right pleural cavity at this time, but the three large cavities are still present in the right side of the chest. The cavities, however, are not nearly as large as on the first examination."

The blood count on this date showed hemoglobin per cent, red cells 3,160,000 and white cells 6,650, polymorphonuclears 16 per cent and lymphocytes per cent. The temperature had been between 98 99 F., and the breath sounds in the right side of chest were coming through better than before, but were still somewhat decreased.

On June 23 another roentgenogram of the chest made (fig. *C*), which showed the following pict "The cavities that were present in the right side the chest have now almost completely disappeared, most of that side of the chest seems to be filled what appears to be normal lung structure. The sha of the heart is considerably above the average in for a person of this age, and there is considerable wi ing of the shadow of the mediastinum." On August when the baby was 8 months of age, she appeared be in good health. Her weight was 15 pounds 1 o (6,832.23 Gm.), and her height was 27½ inches (69 c She was very active, took feedings well and was having any respiratory difficulties. On physical amination there was still a slight decrease in br sounds, especially in the right axilla; the borders of heart still were somewhat enlarged. The baby c tinued to do well.

On December 27 a final roentgenogram was t (fig. *D*), on which the following report was m "Reexamination of the chest shows some accentua of the peribronchial markings in the medial portio each lung, more especially the right. The apexes the peripheral pulmonary fields appear clear. costophrenic angles are well outlined, the diaphrag smooth and the heart and the mediastinum ap normal."

The roentgenologist did not mention the previ cavities, which had undoubtedly disappeared by time. It was also noted that the heart did not s any enlargement in the last picture. Since then child has been normal.

SUMMARY

Abscesses of the lung developed in a 10 w old baby who had been born six weeks p maturely.

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HEMOLYTIC ANEMIA IN INFANCY

REPORT OF A CASE WITH DEMONSTRATION OF HEMOLYTIC ACTIVITY OF SERUM

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Recently a case of recurrent acute hemolytic emia in a 4½ month old infant was observed the pediatric service of Vanderbilt University spital.[1] During a hemolytic crisis it was pos- le to demonstrate hemolytic activity of the ient's serum against his own red blood cells well as against those of another patient of same blood group. After splenectomy the ient made a complete recovery. This was ociated with disappearance of the hemolytic ivity of his blood serum.

During infancy recurrent hemolytic anemia, ompanied by slight icterus and enlargement of spleen, is uncommon. In pediatric litera- e this condition has been classified as a form the disease which is variously referred to as genital hemolytic icterus, congenital hemo- c anemia and familial spherocytosis. How- r, the usual criteria by which a diagnosis of genital hemolytic anemia is established may all be present in the infant. In addition, the ical course is not the one usually seen in the lt.

Rarely is a history of similar disease in other mbers of the family obtained when the disease ncountered in the first year of life. The char- eristics of the disease as it occurs in infancy e been well summarized by Abt[2] and by mond.[3] The initial manifestation of the dis- e often takes the form of an acute hemolytic is. Severe anemia may develop suddenly. In infant icterus is usually slight, even during acute hemolytic crisis, pallor and splenomeg- being the most outstanding physical findings. Because of the lability of the infantile hemo- etic system, the changes in the peripheral od picture are usually more striking in the nt than in the adult. The response of the iculocytes during a hemolytic crisis may be very great, and these cells may comprise the majority of the circulating erythrocytes. Nucleated red blood cells are also regularly seen in the peripheral blood during the acute hemolytic crisis. Increased fragility of the erythrocytes to hypotonic solution of sodium chloride, which is usually considered diagnostic of the condition, may not be present in the infant. Evidence of increased destruction of blood is uniformly present. There are elevation of the level of serum bilirubin and increase in the excretion of urobilin in the feces.

Results following splenectomy are good in the great majority of cases. Because of the rapidity with which profound anemia may develop during an acute hemolytic crisis, it may be disastrous to postpone splenectomy too long. After preparation of the patient with transfusions of blood the operation should be performed. After splenectomy evidence of excessive destruction of blood usually disappears, and the level of hemoglobin and the erythrocyte count gradually rise to normal values.

REPORT OF A CASE

A 4½ month old white boy was first admitted to the pediatric service on Sept. 27, 1943, because of pallor and irritability of twenty-four hours' duration. The child's history was interesting in that he had had considerable vomiting and diarrhea during the first three months of life. However, during the month prior to his admission he had had good health and had gained weight satisfactorily. The parents had noted no icterus or pallor in the infant during the neonatal period. No history of jaundice or anemia in any other member of the family could be elicited. One sibling, 4 years old, was living and well. Twenty-four hours before his admission the patient became pale and listless and refused his feedings.

Physical examination revealed a well developed and well nourished infant. He appeared listless and breathed rather rapidly. The skin and the mucous membranes were extremely pale, and the scleras were slightly icteric. The heart was enlarged, and a blowing systolic murmur was audible over the entire precordium. There was slight injection of the nasal and pharyngeal mucosae. The spleen was easily palpable 2 cm. below the costal margin. The results of the remainder of the physical examination were not remarkable.

Laboratory tests furnished the following data: hemoglobin 4.5 Gm. per hundred cubic centimeters of blood, red blood cell count 2,300,000 and white blood cell count 20,000. The differential count showed segmented

From the Department of Pediatrics, Vanderbilt versity School of Medicine.

1. Dr. James C. Overall permitted us to report this .

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polymorphonuclear leukocytes 36 per cent, stab forms 8 per cent, juvenile forms 6 per cent, eosinophils 1 per cent, basophils 1 per cent, lymphocytes 45 per cent and myelocytes 3 per cent. Eighteen nucleated red blood cells were counted per hundred white blood cells. The icteric index was 15 and the van den Bergh reaction indirect. The reaction to the Kahn test of the blood was negative.

The patient was thought to have acute hemolytic anemia secondary to an infection of the upper part of the respiratory tract. He was given transfusions of whole blood. No difficulty was experienced in cross matching the blood, and no untoward reaction followed transfusion. His condition improved rapidly, and he was discharged on Oct. 1, 1943. At this time his hemoglobin was 10.2 Gm. per hundred cubic centimeters of blood, and his red blood count was 4,000,000.

Five days later the child was readmitted to the hospital because of the sudden onset of dyspnea, drowsiness and pallor thirty-six hours before admission. Physical examination at this time gave virtually the same results as on the preceding admission. The skin and the mucous membranes were very pale and slightly icteric. The spleen was palpable 4 cm. below the costal margin. Laboratory analysis showed hemoglobin 4.3 Gm., red blood cell count 1,400,000 and white blood cell count 32,000. There were 6 nucleated red blood cells per hundred leukocytes. Thirty-two per cent of the erythrocytes were reticulocytes. There was no increase in the erythrocyte fragility to hypotonic solution of sodium chloride. The patient's red blood cells showed hemolysis beginning with a concentration of 0.42 per cent and complete at 0.34 per cent. Hemolysis of the control cells began at 0.40 per cent and was complete at 0.32 per cent. Sickle cell preparations showed no sickling of the patient's red cells at the end of twenty-four hours. Fragility test on both parents gave normal results.

Again the child was treated with repeated transfusions of whole blood. His general condition improved rapidly, and he was discharged on Oct. 10, 1943. At this time his hemoglobin was 11 Gm. per hundred cubic centimeters, and his red blood cell count was 3,300,000.

Two days later the child was admitted for the third time. Eighteen hours before admission he had again become drowsy, pale and dyspneic. Physical examination again revealed marked pallor, slight icterus and splenomegaly. There had been a precipitous drop in the hemoglobin to 4.0 Gm., and the erythrocyte count had fallen to 1,200,000. Fragility tests again showed normal resistance of the erythrocytes to hypotonic solution of sodium chloride. Blood serum and cells were obtained at the time of admission, and an attempt was made to demonstrate hemolytic activity of the patient's serum against his own cells as well as against cells of another person of the same blood group. The results of these tests will be discussed under experimental procedure.

The patient was given repeated transfusions of whole blood. After this the hemoglobin rose to 11 Gm. and the red cell count to 4,200,000. However, forty-eight hours later the hemoglobin had dropped to 4.3 Gm. and the erythrocyte count to 1,600,000. The child was given three more transfusions, totaling 300 cc. In spite of this there was only a slight rise in the level of hemoglobin, to 6.4 Gm., and in the erythrocyte count, to 2,200,000.

Because of the recurrent, acute hemolytic crises and the failure of the patient to respond to blood transfusions except for brief periods, splenectomy was performed on Oct. 18, 1943. The infant stood the operative procedure well.

The spleen weighed 122 Gm. It was deep reddish purple. Microscopic examination revealed some thickening of the capsule. The sinuses were engorged red blood cells, hemosiderin and occasional polymorphonuclear cells. There was little fibrosis, and lymphoid tissue appeared normal.

The patient's postoperative course was uneventful. There was no further evidence of destruction of blood during his stay in the hospital. Examination of blood three months later showed hemoglobin 14 and red blood cell count 4,500,000.

EXPERIMENTAL STUDIES

Method.—Estimation of the hemoglobin content of serum may serve as an index of destruction of blood certain cases of hemolytic anemia. The value of serum hemoglobin in blood obtained under carefully controlled conditions will be determined by three factors: The rapidity with which the destruction of blood cells proceeds, the rate at which hemoglobin the serum is converted into bile pigments, and the rate of excretion of hemoglobin in the urine.

Determinations were made of the hemoglobin the patient's blood plasma and in several samples blood plasma obtained from normal persons. In obtaining the plasma the precautions against hemolysis lined by Ham[4] were observed. The hemoglobin tent was determined by the colorimetric benzidine method described by Wu[5] as modified by Bing Baker.[6] Our results on normal plasma, which are agreement with the values reported by Ham, ra from 2 to 5 mg. of hemoglobin per hundred cubic meters of plasma. On two occasions before splenectomy the patient had plasma hemoglobin contents of 34 47.5 mg. respectively per hundred cubic centimeters. After splenectomy the plasma hemoglobin was 6.6 per hundred cubic centimeters of plasma.

Blood serum and a 10 per cent suspension of washed red blood cells were prepared from the blood of patient and from that of a control of the same group. Two series of tests were then set up as follows. In series A, 0.5 cc. of the suspension of the patient's cells was added to 0.5 cc. portions of (*a*) the patient's serum, (*b*) the acidified serum of the patient,[7] (*c*) control's serum and (*d*) the acidified serum of the control. In series B, 0.5 cc. of the control cell suspension was set up in the same manner, with the two serums both normal and reduced p_H. After gentle mixing the tubes were incubated for an hour at 37 C. and then centrifuged. The supernatant serum was carefully removed. The degree of hemolysis in the various tubes was measured by doing quantitative hemoglobin determinations on this serum. The total value of hemoglobin determined was corrected by subtracting the amount of hemoglobin which was present in the respective serums before the cell suspensions were added. Thus the figures for hemoglobin presented here are the increment in serum hemoglobin due to hemolysis during the period of incubation.

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5. Wu, H.: J. Biochem. **2**:189, 1922-1923.

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7. The acidified serum was prepared according to the directions of Ham by the addition of 5 per cent (by volume) of third-normal hydrochloric acid to the serum.

Results.—The table shows the results of studies ried out before and after splenectomy was formed on our patient. These results indicate abnormal hemolytic activity of the patient's m against his own red blood cells as well gainst red blood cells from a normal control he same blood group. This hemolytic activity enhanced by acidification of the serum. In- ation of the patient's red blood cells with mal serum, at either normal or reduced p_H, wed only the same slight degree of hemolysis was observed when normal cells were incu- d under similar conditions. The patient's m, however, caused about four times as much olysis of both the patient's and the control's as did normal serum. Acidification of the ent's serum increased the hemolytic effect on

ements in Serum Hemoglobin of a Patient with Recurrent Acute Hemolytic Anemia Before and After Splenectomy

		Increments in Serum Hemoglobin, Mg.
Before Splenectomy		
tient's cells	+ Patient's serum	50.6
	+ Acidified patient's serum	82.6
	+ Control's serum	12.6
	+ Acidified control's serum	12.6
ntrol's cells	+ Patient's serum	47.0
	+ Acidified patient's serum	111.0
	+ Control's serum	9.2
	+ Acidified control's serum	9.1
After Splenectomy		
tient's cells	+ Patient's serum	3.0
	+ Acidified patient's serum	7.0
	+ Control's serum	3.1
	+ Acidified control's serum	3.1
ntrol's cells	+ Patient's serum	4.4
	+ Acidified patient's serum	3.7
	+ Control's serum	2.1
	+ Acidified control's serum	3.7

the patient's and the control's cells. After ectomy, the hemolytic activity of the pa- 's serum was no longer present.

COMMENT

ttempts to determine the pathogenetic anism in congenital hemolytic anemia have r been unsuccessful. Most observers have idered the abnormality to be the production he bone marrow of a defective erythrocyte, spherocyte, which is less resistant to hypo- solution of sodium chloride than is the al red blood cell. However, a number of of the disease have been reported in which was normal fragility of the erythrocytes.[8]

Attempts to demonstrate serum hemolysins in patients with the disease have so far as we know been uniformly unsuccessful. Bergenhem and Fåhraeus[9] suggested that the disease may be due to an increased production of lysolecithin, a hemolytic substance present in normal blood. Singer[10] found no evidence of increased production of lysolecithin in patients with congenital hemolytic anemia.

The findings in the present case would exclude a mechanism such as that encountered in paroxysmal nocturnal hemoglobinuria. In that disease increased hemolysis of erythrocytes occurs when the cells are incubated at a decreased p_H in the presence of normal serum. The defect in cases of that disorder is apparently in the erythrocytes: It consists of decreased resistance by the cells to a reduced p_H in the presence of some substance normally present in all serum.

Our findings are more nearly analogous to those described in certain cases of acute acquired hemolytic anemia in which hemolysins have been demonstrated.[11] Unfortunately, attempts to determine the specific nature of the hemolytic substance in the present patient's serum were not made.

One may well question the justifiableness of classifying this case and similar cases with cases of congenital hemolytic anemia. The criteria for the diagnosis of that condition should probably include the presence of spherocytosis in other members of the family and the persistence of spherocytosis and of increased hypotonic fragility of the red cells after splenectomy. It is our plan to test patients with familial hemolytic icterus for hemolytic activity by the method outlined here. The demonstration of hemolysins in cases with a positive family history of the disease as well as in cases like the one here presented would suggest a common mechanism.

SUMMARY

Recurrent hemolytic anemia was observed in a 4½ month old boy. Demonstration of hemolytic activity of the patient's serum was accomplished during an acute hemolytic crisis. After splenectomy the hemolytic activity was no longer demonstrable in the patient's serum, and the patient was cured of this disease.

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FAMILIAL CHARACTER OF FIBROCYSTIC DISEASE OF THE PANCREAS

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DETROIT

Additional information regarding the familial character of fibrocystic disease is afforded by a family in which this condition was proved to occur in 2 children and probably occurred in 3.

Many instances are on record of the deaths of 2 siblings as a result of this condition. A brief review of 120 cases of fibrocystic disease which have been reported has revealed 12 families in each of which 2 children were affected. Andersen [1] stated, "The disease is proved to have occurred more than once in 3 of 23 families and may have occurred in 5 more." Two of the 3 instances Andersen referred to involved siblings who were not twins and 1 involved twins; the last case was cited from Blackfan and Wolbach.[2] The twins, who died of the disease, were of the same sex, but it is not known whether they were identical. Blackfan and May described another set of twins who died of this disease in the first few days of life, the diagnosis being confirmed at autopsy.[3] These twins are not known to have been identical either. There are also a case of 2 siblings reported by Bartlett [4] and another reported by Kramer,[5] with proof of the disease by autopsy. In the case of 2 siblings described by Flax [6] 1 was proved by autopsy to have had the disease; it is probable on clinical grounds that the other had it also. The cases of proved and of probable familial occurrence, with the case reported in the present paper, are summarized in the following tabulation:

Author	2 Proved Cases in Family	2 Probable Cases in Family
Andersen [1]	2	5
Blackfan and Wolbach [2]	1	
Blackfan and May [3]	1	
Bartlett [4]	1	
Kramer [5]	1	
Flax [6]		1
Howard	1 *	

* In addition to the 2 proved cases there was 1 probable case of fibrocystic disease. See text.

Thomas and Schultz [7] reported 1 case fibrocystic disease in which the patient h 3 normal siblings, and Jeffrey [8] reported a simi case in which there were 7 normal siblin These cases emphasize the factors of chance a scatter, and show that although the factor disease is in a family, it may not appear m than once.

Recent investigative work of Warkany [9] suggested that certain congenital anomalies m be due to dietary deficiency in the maternal d during gestation. Four sets of twins have b described in the articles on fibrocystic disea Of the 2 sets of twins from Blackfan a Wolbach [2] and from Blackfan and May [3] resp tively all 4 babies died, and all 4 had the disea Of each of the 2 sets reported by Gamble [10] a by Rasor and Stevenson [11] respectively 1 tw was normal and 1 twin had the disease. In t last 2 sets the external conditions, such as di were of course identical, and the twins we fraternal. Here, then, are 2 instances in whi the disease must have been inherited.

In the case reported by Flax [6] the mater grandmother had had 6 pregnancies, from wh only 1 living child survived, the mother of t patient in the case he reports. A similar fa appears in the history of the family h described—the paternal grandmother was one a large family in which 7 infants died in ea infancy. Although the cause of death in t paternal grandmother's family is not known, seems likely that the deaths were due to a we ness of the same nature as that appearing in t present generation.

The autopsy reported by Flax,[6] which show fibrocystic disease in the pancreas at 45 hours age, seems to indicate that the disease proc was present during the greater part of fetal li No pathologic condition of the lungs w described, the lungs being considered entir normal. The patient in case 3 of the pres

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4. Bartlett, F. H., in discussion on Andersen.[1]

5. Kramer, B., in discussion on Andersen.[1]

6. Flax, L. J.; Barnes, M., and Reichert, J. L.: Vitamin A Absorption and Its Relation to Intestinal Motility in Fibrocystic Disease of Pancreas, J. Pediat. **21**:475-484 (Oct.) 1942.

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ort, who died on the twenty-seventh day with reme infection of the lungs, furnishes an mple of the rapidity with which the process progress.

REPORT OF CASES

The 3 patients whose cases are reported here re children of a physician, Dr. F. The mother had 6 children, of whom 3 have died of rocystic disease and 3 are living and well cept that 1 son has paroxysmal tachycardia. e paternal grandmother was one of a large ily in which 7 children died in infancy. The se of so many deaths in one family and in group of siblings is unknown, but when linked h the present series of 3 deaths in a later up of siblings they suggest a defect of the m plasm in this family. The data on the in- ts of the F. family will be reviewed in order.

Case 1.—The first infant was a girl, born normally erm on Oct. 23, 1935. She began to have peculiar ls at 2 months of age and then began vomiting. persistent cough followed, with nasal irritation and ction, which did not clear. At 6 months of age nchopneumonia and death occurred. Autopsy of the gs revealed multiple abscesses of the lungs and y areas of bronchopneumonia and consolidation. examination of the pancreas was made. The father es that this infant, in appearance and action, pre- ted a clinical picture identical with that seen in the ter infants.

The second infant, a boy, was born normally ril 15, 1937 and is alive and well except for ng subject to paroxysmal tachycardia.

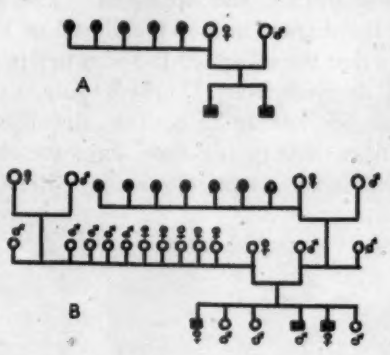
The third infant, a boy, was born normally ne 12, 1938 and is normal in every way.

Case 2.—The fourth infant, a boy, was born nor- ly May 6, 1941. He seemed well, but presented a ding problem at once, usually taking less than 3 ces (90 cc.) per feeding. Administration of a cod r oil concentrate and ultraviolet irradiation were ted at 10 days of age. Six to nine mucus-containing ls were passed daily. The baby was nursed until months of age, supplemental foods being added grad- y. Undigested cod liver oil appeared in the stools. When the patient was 2 months of age a cold and gh developed; the cough persisted for three months. n wheezing started in the early morning; it grad- y became worse and was accompanied by dyspnea, ing of sputum and cyanosis on exertion or crying. Examination showed stridulous breathing, muco- ulent sputum and coarse rales. The tuberculin test e negative results. The number of leukocytes in- ased, and a secondary anemia was present. The ls were bulky, fatty and foul smelling. The level vitamin A in the blood was 3 U.S.P. units per dred cubic centimeters (control, 28 U.S.P. units). ere was 0.01 mg. per hundred cubic centimeters of tenoids (control, 0.18 mg.). The sputum showed a vy growth of staphylococci (coagulase positive) and type IV pneumococci. Four days after admission ,000 U.S.P. units of vitamin A was given intra- scularly; the dose was repeated in two days. Fifteen ps of percomorph liver oil was given daily. The k formula consisted of 5.5 Gm. of pancreatin and 2 ounces (77 Gm.) of banana powder added to 1 quart (0.9 liter) of milk. The level of vitamin A in the blood rose to a low normal value, but no carotenoids were ever demonstrated. Sulfathiazole and blood transfusions were given, but the infant did not survive, death occurring eleven days after his admission to the hospital.

The postmortem diagnosis was: (1) fibrosed and cystic pancreas, with (*a*) dilatation of the ducts of the pancreas, (*b*) chronic pancreatitis and (*c*) malformation congenital hypoplasia of the pancreas; (2) bronchitis; (3) enterogenous cyst of the mesentery, and (4) ascites.

The weight of the pancreas was 10 Gm. The pattern was not that of normal lobules; the surface was finely pitted and trabeculated. Viewed microscopically, the amount of pancreatic parenchymal tissue in each lobule was seen to be decreased. Most of the tissue consisted of islet tissue, dilated ducts and ductules. The lumen was filled with amorphous material. The large ducts toward the head of the pancreas were dilated. The islet tissue was normal.

The major pancreatic duct was patent; consequently the changes could not have been due to obstruction. Marked lobular fibrosis was present, with normal islets, but with atrophic or absent acini. An occasional acinar



Genetic charts showing grouping of infantile deaths. Black disks represent infants dying from unknown causes, black rectangles infants dying from cystic pancreatitis and white disks surviving infants. *A*, the family reported by Flax. *B*, family F. of this report.

cell was filled with normal granules of zymogen. The lesion might more accurately be characterized as chronic pancreatitis secondary to or associated with stasis and dilatation than as cystic fibrosis.

Case 3.—The fifth infant, a girl, was born normally Jan. 12, 1943, weighing 8 pounds and 9 ounces (3,884 Gm.). She was never well. From birth she presented a feeding problem. Breast feeding was discontinued, and protein milk was prescribed because of numerous frothy stools. Coughing started during the first week of life; vomiting was present during the second week. Cyanotic attacks with dyspnea became evident the third week. Roentgenograms of the chest showed consolidation of the upper lobe of the right lung and infiltration throughout the rest of the lung fields. Extreme dyspnea occurred at this time, and vomiting became more marked.

The stool showed 26 per cent fat in the dried residue. The blood diastase was 6.6 units (Myers and Killian) (normal, 15 to 25 units); the blood cholesterol content, 133 mg. per hundred cubic centimeters. Supportive treatment with sulfadiazine, fluids administered parenterally, transfusions and oxygen were given, but unsuccessfully. The infant died Feb. 8, at the age of 27 days; she weighed 7 pounds 2 ounces (3,232 Gm.).

Autopsy revealed fibrocystic pancreatitis, the pancreas weighing 4 Gm. and grossly showing normal lobular markings. On section many dilated ducts filled with acidophilic casts were found throughout all sections taken. The majority of these averaged only 50 to 200 microns in diameter. They were lined by low columnar or cuboidal cells. In addition to these dilated ducts, there were many smaller moderately dilated acini, all filled with acidophilic material. There was diffuse increase in the amount of stroma; frequent congeries of lymphocytes were found, but there was no diffuse lymphocytic infiltration. The islet tissue showed no abnormalities. It was average in amount and distribution.

The sixth infant, a boy, was born normally and at the time of writing seems well in every way.

The accompanying genetic charts show the grouping of several early infantile deaths in a single generation of each of 2 families in which fibrocystic disease had appeared. The appearance of the disease in 3 of 6 children of 1 family suggests that the inherited factor is heterozygous, that is, derived from 1 parent only. On the maternal side among 25 cousins, the disease did not appear once; this fact suggests that the inherited factor came from the paternal side only.

SUMMARY

This review shows that there are at least recorded instances of the familial occurrence fibrocystic pancreatic disease.

The literature on the subject describes sets twins both of whom had the condition and ot sets in which only 1 twin was affected.

Extremely unusual grouping of infant de occurred in 2 families in which proved fibrocy disease existed. Two proved and 1 prob instance of the disease in 1 of these families recorded, with a review of deaths of infants in course of three generations. It is suggested this family furnishes an instance of heterozyg inheritance.

The case reported here adds 1 case of fam fibrocystic disease to the 12 previously recor

The details of case 1 were supplied by Dr. W Cheney, Salt Lake City.

The details of case 2 were supplied by Dr. L Dickey and Dr. W. B. Friedman, Stanford Unive School of Medicine. This material has been publish abstract form [12] and has been submitted for public in detail.

Henry Ford Hospital.

12. Dickey, L. B.: Pulmonary Aspects of C Fibrosis of Pancreas, California & West. Med. 57 42 (July) 1942.

ECTODERMAL DYSPLASIA WITH PARTIAL ANODONTIA

M. MICHAEL COHEN, D.M.D., AND RICHARD WAGNER, M.D.
BOSTON

Ectodermal dysplasia is a rare condition characterized by complete or partial anodontia and by defects in other ectodermal structures. Thoma,[1] in his textbook "Oral Pathology," has given a collective review of 18 cases reported in the literature from 1883 to 1941, and Brodie and Sarnat[2] contributed another case in 1942.

REPORT OF A CASE

History.—V. M., a girl born April 7, 1941, came under observation at the children's endocrine clinic on April 28, 1944 at the age of 2 years and 8 months, having been referred from the children's clinic of the Boston

Fig. 1.—V. M. at the age of 2 years 8 months.

Dispensary because of the peculiar behavior of her teeth and nails. The mother stated that neither finger nails nor toe nails ever grew; hence they were never cut. The patient neither complained of excessive heat nor suffered from spells of fever or syncope on exposure to the summer sun. She had never been sick and had developed uneventfully. There was no history of familial or hereditary incidence of a similar condition.

Physical Examination.—The patient was a well nourished and well developed girl weighing 25 pounds 12 ounces (11.64 Kg.). She was 36½ inches (92.7 cm.) tall. The skin appeared normal. The lower eyelids were inverted. The bridge of the nose was broadened. There were epicanthal folds (fig. 1). The finger and toe nails were convex and poorly developed; figure 2 shows marked shallow depressions. The toe nails resembled those seen in other trophic disturbances of the ectodermal layer. The hair was smooth and soft, showing no form of alopecia; no lanugo hair was present.

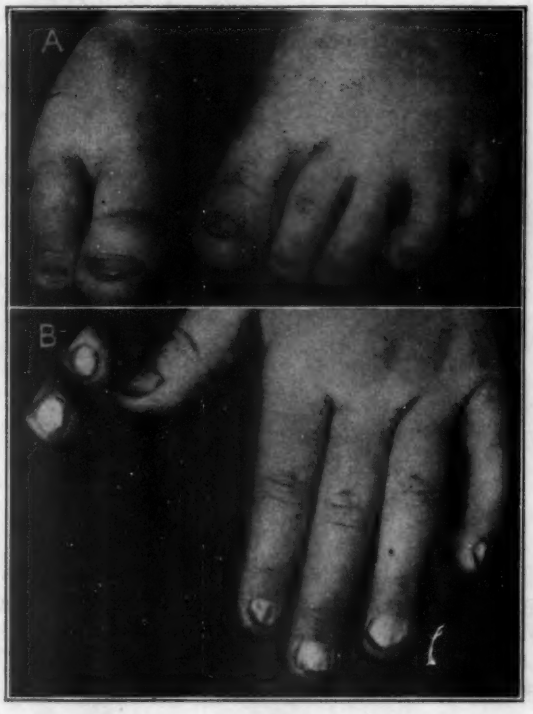


Fig. 2.—*A*, toe nails of V. M. *B*, finger nails of V. M.

Oral examination of the maxilla revealed two upper caniniform teeth in the canine region and two partially erupted molars. The mandible had two peg-shaped incisors and two atypical canines (fig. 3). The clinical diagnosis of ectodermal dysplasia was made.

Intraoral roentgen examination (fig. 4) revealed no other tooth bud in the maxilla, but the mandible showed another incisor and two molars unerupted without other tooth buds. Altogether there were only eleven teeth detectable by roentgen examination in both jaws.

A lateral roentgenogram of the skull appeared normal and compared favorably with those of other children of this age group.

The carpal development was consistent with the chronologic age.

From the Department of Pediatrics of Tufts College Medical School, the Children's Department of the Boston Dispensary and the Department of Orthodontia Tufts Dental School.

1. Thoma, K. H.: Oral Pathology, St. Louis, C. V. Mosby, 1941, pp. 142-148.

2. Brodie, A. G., and Sarnat, B. G.: Ectodermal Dysplasia (Anhidrotic Type) with Complete Anodontia, Am. J. Dis. Child. **64**:1046-1054 (Dec.) 1942.

A psychometric test placed the intelligence quotient of the child at 100.

Biopsy of Skin from Groin (Dr. MacMahon).—Gross examination: The specimen consisted of a minute wedge-shaped scrap of skin.

Microscopic examination: The skin showed an unexplained fresh hemorrhage into the corium. There was no evidence of inflammation or of tumor.

Addenda: The epidermis, the hairs and the sweat glands were free of pathologic conditions. There was no melanosis. There were no sebaceous glands in the section.

The presence of sweat glands is consistent with the statement of the mother that the child did not complain of any inequality of temperature, a circumstance which might be attributed to lack of sweat glands.

COMMENT

This case does not reveal all the signs and symptoms which belong to the classic syndrome

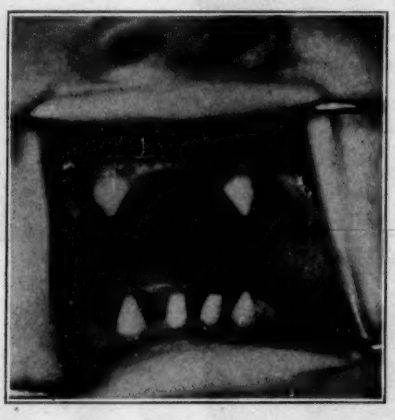


Fig. 3.—Peg-shaped teeth in ectodermal dysplasia.

of ectodermal dysplasia. The skin, hair, iris, sweat and sebaceous glands and finger and toe nails start to develop soon after the second month of fetal life. According to Schour and Massler,[3] the first sign of the development of teeth in human beings is seen during the sixth week of embryonic life. If the faulty development is severe and presents itself before the sixth week of fetal life, the teeth will be affected. After the second month of embryonic life the other ectodermal structures may be affected. Various syndromes, however, may result from the involvement of different structures. Theories regarding ectodermal dysplasia seem to indicate that it is sex linked and recessive, being transmitted by female carriers and occurring in males. In certain instances the defect is present in the female carrier. Other investigators[4] classify anomaly as a mendelian dominant character. the 20 patients described in the literature, cluding the patient under discussion (14 m and 6 females), only 10 had pathologic co tions of the skin, which shows that the inte ment is not always involved. Similarly, i least half of the reported cases the nails w normal.

Involvement of the teeth with either par or complete anodontia was manifested in 20 cases. Peg-shaped incisors were found in

Fig. 4.—Intraoral roentgenogram in ectoder dysplasia.

12 cases of partial anodontia. Peg-shaped te are known in other congenital anomalies. T are seen in mongolian idiocy, in which the br (ectodermal in origin) is always involved. severe mental retardation has been reported any case of ectodermal dysplasia. All patients were normal except 1, who was ported to be slightly retarded.[5]

520 Beacon Street.

370 Commonwealth Avenue.

3. Cited by Orban, B.: Oral Histology and Embryology, St. Louis, C. V. Mosby Company, 1944, pp. 33-52.

4. Holt, L. E., and McIntosh, R.: Holt's Disea of Infancy and Childhood, ed. 11, New York, D. Ap ton-Century Company, Inc., 1940, p. 352.

5. Nager, F. R.: Ueber das Vorkommen von Od bei angeborenen Haut- und Zahnanomalien, Arch Laryng. u. Rhin. **33**:426, 1920.

Abstracts from Current Literature

ochemistry; Bacteriology, and Pathology

ANTIBACTERIAL PROPERTIES OF CRUDE PENICILLIN. MURRAY FISHER, Bull. Johns Hopkins Hosp. **73:** 43 (Nov.) 1943.

method is described for the production of crude illin. While the potency of the product is less one-thousandth that of the extract, clinical experi- with it is encouraging enough to make the author ve that it will have a place in local therapy for in infections.

LYTTLE, New York.

FATE OF THE VIRUS OF LYMPHOGRANULOMA VENEREUM IN INFECTED MICE RECEIVING SULFONAMIDE THERAPY. ENID C. RODANICHE, J. Infect. Dis. **73:**173 (Nov.-Dec.) 1943.

here is active multiplication of the virus of lympho- uloma venereum in the brains of mice treated with diazine and sulfathiazole.

e virus is not recovered from the spleens of such als in the great majority of instances, although it adily isolated from the spleens of untreated animals. araaminobenzoic acid exerts some antagonism to the n of sulfathiazole on this virus.

he virus of lymphogranuloma does not become re- nt to sulfonamide compounds within seven mouse ages.

TOOMEY, Cleveland.

VIVAL OF BACTERIA ON THE SILVER COMMUNION CUP. WILLIAM BURROWS and ELIZABETH S. HEMMENS, J. Infect. Dis. **73:**180 (Nov.-Dec.) 1943.

vidence is presented which indicates that bacteria bbed on the polished surface of a silver chalice die rapidly. Experiments on the transmission of test anisms from one person to another by common use chalice showed that only approximately 0.001 per of the organisms are transferred even under the t favorable conditions; when conditions approxi- ed those of actual use, no transmission could be cted. Only small numbers of bacteria from the mal mouth could be recovered from the chalice im- iately after its use by 4 persons. It is concluded in practice the silver communion cup is not an ortant vector of infectious disease.

TOOMEY, Cleveland.

E TREATMENT OF MENINGOCOCCIC MENINGITIS. ANNETTE C. WASHBURNE, Wisconsin M. J. **42:**1239 (Dec.) 1943.

Meningococcic meningitis requires immediate and in- sive action. The following procedures are listed: mpt spinal tap (or cisternal if necessary) if there definite or suspicious signs of meningitis; cell count differential count; determinations of sugar and pro- and a colloidal gold test; Wassermann test, and n for predominating organism and culture. Of these, cell count, the test for sugar and the identification redominating organisms should be done immediately. ce a cloudy fluid may also be found in syphilitic ningitis, brain abscess, sinus thrombosis, extradural cess and occasionally poliomyelitis, these conditions should be differentiated. A blood culture should also be done at this time.

In treatment, large initial doses of sulfadiazine and early intensive medication are essential. Administration of sulfadiazine should not be completely discontinued for ten or twelve days. It is best given by mouth, or by nasal catheter if the patient is comatose. The sodium salt (5 per cent solution) may be given by intravenous drip; care should be taken to avoid leakage into tissue and not to give a blood transfusion or an intravenous injection of dextrose solution at the same time.

A solution of sodium sulfadiazine, 5 Gm. in 500 cc. of isotonic solution of sodium chloride (1 per cent), may be given subcutaneously at the rate of 250 to 300 cc. per hour. Sulfadiazine should not be given intrathecally, intramuscularly or by rectum. When possible, except in critical conditions, the sulfonamide drug is best given orally. Sodium bicarbonate in 1 to 2 Gm. doses reduces the formation of crystals. Daily clinical examination for mental status (alertness, confusion, etc.), meningeal changes, otitis or deafness, involvement of the chest and heart, full bladder, orchitis, petechiae, edema, state of reflexes, type of breathing and intake and output should be made. A blood count, urinalysis and determination of the blood level of sulfadiazine (desirable concentration, 15 to 18 mg.) should be done the first week. For an adult the fluid intake should not be under 3,500 cc. or the output below 1,500 cc. per twenty-four hours.

In addition to the initial spinal tap, one or two more may be done after the eighth or ninth day to determine the degree of cure or to relieve increased pressure. Sedation, including administration of codeine, may be wise. If the therapy is not promptly effective a change in the type of sulfonamide compound (to sulfamerazine, etc.) or the use of antimeningococcus serum is indicated.

JANNEY, Wauwatosa, Wis.

Metabolism; Infant Feeding; Milk and Other Foods

STUDIES OF CALCIUM AND PHOSPHORUS METABOLISM IN THE CHICK. EVAN W. MCCHESNEY, J. Nutrition **26:**487 (Nov.) 1943.

Evan W. McChesney has determined the relative effectiveness of vitamins D_2 and D_3 and dihydrotachysterol when administered parenterally to the chick in propylene glycol and corn oil. Dihydrotachysterol was 300 per cent more effective than vitamin D_3 orally; however, parenterally it was on the average only about 20 per cent more effective. D_3 was somewhat better absorbed from the digestive tract than D_2.

FREDEEN, Kansas City, Mo.

THE NUTRITIVE VALUE OF PROTEIN. ROBERT A. STEWART, GEORGE W. HENSLEY and F. N. PETERS JR., J. Nutrition **26:**519 (Nov.) 1943.

Robert A. Stewart and others conclude that normal cooking does not impair the quality of protein; however, severe heat treatment by means of the explosion technic destroyed the quality of oat protein considerably.

FREDEEN, Kansas City, Mo.

Vitamins; Avitaminoses

RIBOFLAVIN AND THIAMINE INTERRELATIONSHIPS IN RATS AND IN MAN. JOSEPH W. FERREBEE and NORMAN WEISSMAN, J. Nutrition **26**:459 (Nov.) 1943.

J. W. Ferrebee and N. Weissman report that their observations failed to demonstrate that thiamine deficiency in itself has an effect on riboflavin metabolism. The increased excretion of riboflavin appears to be an unspecific phenomenon of the late stages of thiamine deficiency related to the rapid metabolism of tissues that occurs when the thiamine requirements can be satisfied only by loss of tissue.

FREDEEN, Kansas City, Mo.

LOSSES OF B VITAMINS DUE TO COOKING OF FOODS. VERNON H. CHELDELIN, ALETHEA M. WOODS and ROGER J. WILLIAMS, J. Nutrition **26**:477 (Nov.) 1943.

The authors present determinations of cooking losses in 30 foods of riboflavin, nicotinic acid, pantothenic acid, biotin, inositol and folic acid.

FREDEEN, Kansas City, Mo.

A STUDY OF NORMAL HUMAN REQUIREMENTS FOR ASCORBIC ACID AND CERTAIN OF ITS METABOLIC RELATIONSHIPS. HELEN J. PURINTON and CECILIA SCHUCK, J. Nutrition **26**:509 (Nov.) 1943.

The daily human requirements for ascorbic acid were found to be in excess of 100 mg. per day for the young adult; and for adults between 25 and 50 years of age, less than 100 mg. Purinton and Schuck note that the requirements for ascorbic acid are influenced by certain factors, such as the basal metabolic rate and the hemoglobin level and the metabolism of citric acid.

FREDEEN, Kansas City, Mo.

DETERMINATION AND CONTENT OF CAROTENE AND VITAMIN A IN WISCONSIN BUTTER. SOLL BERL and W. H. PETERSON, J. Nutrition **26**:527 (Nov.) 1943.

Soll Berl and W. H. Peterson note that 75 per cent of the total natural butter pigment in summer was carotene; in winter 60 to 65 per cent was carotene. The summer butter (July and September) averaged about 18,000 U. S. P. units of vitamin A per pound; winter butter (January), 10,500 U. S. P. units per pound, and spring butter (March), 9,500 U. S. P. units per pound. Storage of butter as long as eight months did not result in a loss of carotene or vitamin A.

FREDEEN, Kansas City, Mo.

THE ASCORBIC ACID REQUIREMENTS OF SCHOOL-AGE GIRLS. VIVIAN M. ROBERTS, MARGARET HESSLER BROOKES, LYDIA J. ROBERTS, PEGGY KOCH and PEGGY SHELBY, J. Nutrition **26**:539 (Nov.) 1943.

The ascorbic acid requirement of preadolescent girls of 6 to 12 years for adequate saturation with vitamin C was 62 to 72 mg. daily.

FREDEEN, Kansas City, Mo.

THE RETENTION OF VITAMINS IN VEAL AND LAMB DURING COOKING. J. M. MCINTIRE, B. S. SCHWEIGERT and C. A. ELVEHJEM, J. Nutrition **26**:621 (Dec.) 1943.

J. M. McIntire and others found that almost the entire decrease in the weight of meat during cooking was due to loss of water. Roasted and broiled m retained more moisture than those braised and stew and vitamin retention corresponded with water re tion in every case.

FREDEEN, Kansas City, M

INFLUENCE OF INCREASING DOSES OF THIAMINE A RIBOFLAVIN ON EFFICIENCY OF THEIR UTILIZATI BARNETT SURE and ZENAS W. FORD JR., J. Nu tion **26**:659 (Dec.) 1943.

B. Sure and Z. W. Ford Jr. conclude that animal organism has only a very limited capacity storing these two components of the vitamin B c plex. A quantitative metabolism study was made of influence of increasing doses of thiamine and riboflа on their efficiency of utilization. On higher levels intake the efficiency of utilization decreased; this s gests that part of the losses of thiamine and riboflа in metabolism were caused by their destruction in tissues.

FREDEEN, Kansas City, M

Hygiene; Growth and Nutrition; Public Hea

WHAT'S WRONG WITH OUR SCHOOL HEALTH SERVI HAROLD MITCHELL, New York State J. Med. 527 (March 15) 1943.

This paper is one in a panel discussion of sch health services. We need medical leadership rat than lay control to determine the quality of medi service to be given in the schools. Physicians h been required to examine too many children, and examinations have been too superficial. In order improve these services it is suggested that a medi society advisory committee should be recognized a part of every school system.

"I have heard state education officials stress health educational value of the health examinati but I have never discovered that they appreciate w bad education it is for parents and children to ge false sense of security from inadequate examinati in school." The physician in the school should as an adviser, consultant and educator, not as a m examiner..

AIKMAN, Rochester, N. Y

WAYS TO MORE EFFECTIVE SCHOOL HEALTH SERVI GEORGE WHEATLEY, New York State J. Med. 529 (March 15) 1943.

This paper is one in a panel discussion of sch health services. Medical records should be modernі and then carefully preserved. It is worth while train volunteer aids to do this work. Teachers m make semiannual tests of vision and measure the hei and weight of the child. Audiometer tests may be m by technicians. By the use of lay assistants, the phy cian will be enabled to give his time to more import matters. Increased participation of the private phy cian is also advised.

AIKMAN, Rochester, N. Y

Prematurity and Congenital Deformities

COMBINED ANTERIOR AND POSTERIOR SPINA BIFIDA A LIVING NEONATAL HUMAN FEMALE. R. L. C. H. SANDERS, Anat. Rec. **87**:255 (Nov.) 1943

It was observed that in a 2 day old baby with mucosal mass projecting over the lumbosacral reg feces were passed through this and per anum. De at 5 months was followed by postmortem examinati which revealed a fistula connecting the colon thro the cleft in the vertebrae; the cord was divided i

portions below, having two sets of nerves from left side and one from the right. Thirty-seven s of this condition have been reported.

SNELLING, TORONTO, CANADA.

E EFFECT ON THE FETUS OF PENTOBARBITAL SODIUM AND PENTOTHAL SODIUM. ROBERT DREISBACH and FRANKLIN F. SNYDER, J. Pharmacol. & Exper. Therap. **79**:250 ((Nov.) 1943.

An investigation of the effects of pentobarbital sodium pentothal sodium on the fetus was made because se drugs are said to be used extensively in obstetric ctice. The fetuses (rabbit) were observed through uterine wall, which had been exposed by laparotomy r section of the lumbar portion of the spinal cord h the area under procaine anesthesia. Pentothal ium was found to be relatively nontoxic to the fetus, as much as 55 mg. per kilogram of maternal body ght by vein to the mother rabbit had relatively little nulative effect on the fetus.

Fetal apnea following the injection of pentothal ium into the maternal animal was caused by the g and was not due to anoxemia, since analyses of l blood showed that the content of oxygen and of bon dioxide remained normal.

PILCHER, Cleveland.

Newborn

UTRITION STUDIES DURING PREGNANCY: IV. RELATION OF PROTEIN CONTENT OF MOTHER'S DIET DURING PREGNANCY TO BIRTH LENGTH, BIRTH WEIGHT AND CONDITION OF INFANT AT BIRTH. B. S. BURKE, V. V. HARDING and H. C. STUART, J. Pediat. **23**:506 (Nov.) 1943.

This paper is one of a series dealing with the impor- ce to both mother and infant of adequate nutrition ring pregnancy. The material presented was collected a part of the research program undertaken by the partment of child hygiene of the Harvard School of blic Health at its Center for Research in Child alth and Development. The mothers and infants nsidered are the same as described in the introductory ticle of the series (Burke, B. S.; Beal, V. A.; Kirkood, S. G., and Stuart, H. D.: Nutrition Studies uring Pregnancy, *Am. J. Obst. & Gynec.* **46**:38-52 uly] 1943) in which the group studied and the methods ployed are described in detail.

The average daily content of protein in the diet of ch woman during the latter part of pregnancy has en estimated in grams. In this group of 216 women ly 10 per cent consumed diets which contained the ount of protein (85 Gm.) recommended by the Food d Nutrition Board of the National Research Council r that period (fourth through the ninth month), 22 r cent consumed between 70 and 84 Gm., 68 per cent nsumed less than 70 Gm. of protein daily and 38 per nt less than 55 Gm. daily, or diets which were conlered poor or extremely poor in this important nutrional essential during a period of rapid growth and velopment of the fetus.

A significant relationship (+.80 ±.03) was found to ist between the protein content of the antepartum et of the mother and the length at birth of the infant. ith allowance made for the height of the mother, the rtial correlation between the length of the baby and e amount of total protein in the diet of the mother the latter part of pregnancy is about the same (+.78 .03). If separate calculations are made for boys and rls this increase in birth length is demonstrated with each additional increment (10 Gm.) of protein in the antepartum diet. An increase in weight at birth was also demonstrated with each additional increment (10 Gm.) of protein in the diet of the mother during pregnancy. This relationship, while significant, is not as striking as the correlation between the amount of protein in the maternal diet during pregnancy and the length of the infant at birth. The infant boys were found to be somewhat longer and heavier than the infant girls for any given amount of protein in the diet of the mother. When the protein content of the diet of the mother was under 45 Gm. daily the average length at birth of the infant boys was 47.6 cm. and of the infant girls 46.8 cm.; their average weights at birth were 6 pounds 8 ounces (2,950 Gm.) and 5 pounds 14 ounces (2,650 Gm.) respectively. In contrast when the protein content of the mother's diet was 85 Gm. or more daily the average length at birth of the boys was 53.3 cm. and of the girls 52.4 cm.; their average weights at birth were 9 pounds 2 ounces (4,150 Gm.) and 8 pounds 8 ounces (3,850 Gm.) respectively.

A significant relationship is also shown between the physical ratings assigned by the pediatrician to the infants at birth and within the first two weeks of life and their weights and lengths at birth. The amount of protein in the diet of the mother during pregnancy appears to be an extremely important factor in determining the general physical condition of the infant at birth.

It would appear from this study that from the standpoint of length, weight and general physical well-being of the infant at birth the diet of the mother should be liberally supplied with protein during pregnancy. In terms of simple everyday foods it is clear that if protein is not the key factor other factors which may be important are adequately provided if the antepartum diet is high in protein rich foods. The foods chiefly responsible for the protein in the diets of these women were meat, poultry, eggs, milk, cheese and fish; the nonanimal sources were largely cereal grains.

For practical purposes this study indicates that a diet containing less than 75 Gm. of protein daily during the latter part of pregnancy tends to make the infant short, light in weight and likely to receive a low pediatric rating in other respects.

BURKE, Boston.

LIVER FUNCTION IN THE NEWBORN INFANT. GEORGE W. SALMON and ELLEN EHRENFEST RICHMAN, J. Pediat. **23**:522 (Nov.) 1943.

In a series of studies of newborn infants, determinations of the packed cell volume and of the icterus indexes revealed no relationship between the degree of destruction of blood cells and the severity of the icterus.

Visible icterus might not be present in a newborn infant even though the icterus index was considerably above 15, the threshold level commonly accepted for adults. If the icterus index remained elevated, however, visible icterus appeared. The appearance of visible icterus is a function not only of the degree of hyperbilirubinemia but of the length of time the condition has persisted.

There was no difference in the ability of the liver to excrete sulfobromophthalein in the newborn infants whose icterus index rose to 20 or above and in those whose icterus index remained below 20. Moreover, the ability of the livers of newborn infants to excrete this dye was similar to that reported for adults.

The reaction to the cephalin-cholesterol flocculation test of Hanger showed varying degrees of positivity during the first few days of life and tended to become negative toward the end of the first week of life. There was no obvious difference in the results obtained for the

newborn infants whose icterus index rose to 20 or above and for those whose icterus index remained below 20. It will be difficult to interpret these results until the fundamental reaction of the cephalincholesterol flocculation test is adequately explained.

SALMON, St. Louis.

UNUSUAL INFECTIONS IN THE NEWBORN CAUSED BY STAPHYLOCOCCUS AUREUS. RUTH G. ALEMAN, New Orleans M. & S. J. **96**:207 (Nov.) 1943.

Three instances of recovery from Staphylococcus aureus infections are reported. All 3 patients received sulfonamide drugs, plus other appropriate treatment. One patient with septicemia did not survive.

BERKLEY, Beverly Hills, Calif.

ERYTHROBLASTOSIS FOETALIS AND ITS RELATIONSHIP TO TRANSFUSION. REACTIONS AND ACCIDENTS. THOMAS A. LEONARD, Wisconsin M. J. **42**:1034 (Oct.) 1943.

In 1932 Blackfan, Diamond and Baty concluded regarding the erythroblastotic baby that:

1. There is universal edema, from severe to minimal.

2. Jaundice, "mahogany-brown" typically, is present at birth or appears in forty-eight hours.

3. Early anemia, often obscured by jaundice at first, is always noticeable by the fifth day.

4. Edema, jaundice and anemia may be present in any combination or degree.

5. The infant shows marked lassitude, exhaustion or semishock. It is difficult to feed and gains weight slowly.

6. The heart is uniformly enlarged.

7. The infant shows hemorrhagic tendencies; if not visible during life, these tendencies are always evident at autopsy.

8. Pathologically, there are always extramedullary centers of erythroblastosis and some enlargement of the liver and spleen. Other pertinent facts developed since are:

1. The frequency of erythroblastosis is about 8 in every 1,000 births.

2. Erythroblastosis is responsible for about 5 per cent of all fetal mortality.

3. There is a familial occurrence. In 50 to 80 per cent of instances, after one occurrence subsequent offspring will be affected.

4. Race has no influence.

5. About one third of the mothers of erythroblastotic babies have symptoms of toxemia.

6. The mothers show poor gain in weight, high incidence of hydramnios, decreased fetal activity and usually premature labor.

7. There may be amber-colored liquor amnii or golden vernix.

8. The placenta is always large, heavy and edematous; this condition is often detected by roentgenography.

Theories of cause have been:

1. A primary metabolic disturbance or a dominant mutation of the germ cell of either parent.

2. Failure to inherit an antihemolytic substance.

3. Passive sensitization of the fetus against its own red blood cells by agglutinins from the maternal circulation.

4. Fetal hepatic dysfunction.

In 1938 Darrow suggested that erythroblastosis fe might be due to an antigen-antibody reaction betw the infant's and the mother's blood.

In 1940 Landsteiner found that 85 per cent of persons had red blood cell agglutinogens which rea to rhesus monkey–immunized rabbit serum (Rh-posi blood) and that 15 per cent did not (Rh-nega blood).

In 1940 Wiener and Peters applied the principle the Rh factor to transfusion reactions.

Levine in 1941 showed that 91 per cent of the moth of infants affected with erythroblastosis had Rh-nega blood, as compared with 15 per cent in the gen population, and that 100 per cent of the fathers Rh-positive blood. The ordinary grouping and cr matching of the bloods of the donor and the recip do not reveal these subgroup factors.

Erythroblastosis fetalis is definitely caused by hereditary transmission of the Rh-positive factor fr the father to the fetus and the resultant antibo antigen reaction between the mother and the fetus.

Acute Contagious Diseases

QUANTITATION OF MUSCULAR FUNCTION IN CASES POLIOMYELITIS AND OTHER MOTOR NERVE LESIO ROBERT S. SCHWAB, ARTHUR L. WATKINS MARY A. B. BRAZIER, Arch. Neurol. & Psych **50**:538 (Nov.) 1943.

The authors describe the technic of measurement electrical excitability by voltage-capacity curves. Th think that it is essential to have an accurate objecti test of muscular function in cases of lesions of mot nerves and they suggest that this is the best meth for determining this function.

BEVERLY, Chicago.

CONCURRENT MENINGOCOCCAL MENINGITIS AND SALM NELLA BACTEREMIA. ERWIN R. NETER, J. Pedi **23**:562 (Nov.) 1943.

A case of concurrent meningococcic meningitis a bacteremia due to Salmonella cholerae suis is present A culture of blood taken on the day after the patient admission to the hospital revealed S. cholerae suis. T patient was given 0.5 Gm. of sulfathiazole by mou every four hours for seven days. On the fourth d after admission the temperature returned to normal a remained so until the patient was discharged, cured both meningococcic meningitis and salmonella bact remia. S. cholerae suis was present in the blood of t patient over a period of five days. Specific agglutin tions in high titer against the paratyphoid bacill developed in the course of the illness. The relationsh between the two infections is discussed.

SCOTT, Louisville, Ky.

NEW DEVELOPMENTS IN INFANTILE PARALYSIS. D W. GUDAKUNST, New York State J. Med. **43**:15 (Aug. 15) 1943.

Gudakunst reviews the new observations on poli myelitis up to May 1943. The National Foundation i Infantile Paralysis, Inc., has carefully studied the wo of Sister Kenny, After reports that her methods r lieved pain, reduced stiffness and prevented contracture the Foundation "recommended that the method of trea ment and the concept on which it was based be ma available to the medical and public health authorities this country for their use, if so desired. No oth

ims were made by the National Foundation with pect to this treatment."

AIKMAN, Rochester, N. Y.

UDIES ON THE TREATMENT OF EPIDEMIC EXPERIMENTAL POLIOMYELITIS WITH POLIOMYELITIS ANTISTREPTOCOCCIC SERUM: SUMMARY OF RESULTS. E. C. ROSENOW, Proc. Staff Meet., Mayo Clin. **18**:403 (Oct. 20) 1943.

Rosenow summarizes the results of his studies, which, believes, indicate a causal relation of streptococci to iomyelitis, the proof being the production of the ssic clinical and pathologic picture of poliomyelitis monkeys with virus derived from streptococci.

n 1916 Rosenow first immunized horses with freshly lated strains of living streptococci of poliomyelitis, ich he asserts that he obtained from human beings. er he employed strains freshly isolated from the nal cords of monkeys which had died of experimental iomyelitis after inoculation with the virus. At the l of the period of immunization the antistreptococcus se serum, in extremely high dilutions, agglutinated cifically the poliomyelitis type of streptococci. It tected rabbits against inoculation with the streptoci and monkeys against inoculation with poliomyelitis us.

Immune serum was first employed with patients ring the 1917 epidemic. The serum was administered soon as the diagnosis was established. The mority rate in an untreated group of 23 patients was 35 r cent. Of the 58 patients who received the serum (17.2 per cent) died; of these, 7 were practically ribund at the time of the first serum treatment. Of patients, therefore, 3 for whom the serum might have n beneficial died. Paralysis did not develop in any the 19 patients to whom serum treatment was given fore this condition had appeared, and all promptly covered. Patients who showed evidence of bulbar involvement, even those in the early stages of partial or mplete coma, often responded favorably to administran of the serum, provided it was given soon after the set of these symptoms.

The current method of preparation of the antiserum is follows: Freshly isolated streptococci are placed in nse suspension in glycerin (2 parts) and a 25 per nt solution of sodium chloride (1 part) and kept in refrigerator. Antigenic specificity is preserved almost definitely. All subsequent batches of antistreptococcus rum used for treatment are prepared by diluting such nse suspensions as are needed for injections throughout the period of immunization.

Of the total of 2,664 patients who were treated with e serum, 252 (9.6 per cent) died, as compared with 3 (21.3 per cent) of 2,737 patients in the same epimic who were not given serum. In experiments with onkeys the animals who were given serum exhibited mortality rate one-half to one-third that of the unated control group.

In the course of these studies, the euglobulin fraction poliomyelitis antistreptococcus serum was found diagstic when employed in a cutaneous test. Ninety-two r cent of 324 persons ill with poliomyelitis for from e to fifteen days showed an erythematous patch of sq. cm. or more in from five to ten minutes after the tradermal injection of the euglobulin fraction.

Rosenow states that objections to the general adopon of this treatment have been removed since his cent demonstration of microdiplococci in filtrates of e virus. Further, the classic picture of the disease s been produced in monkeys with virus derived from streptococci, and the diagnostic and preventive action of the serum has been demonstrated.

GUTTMAN, New York.
[ARCH. NEUROL. & PSYCHIAT.]

THE USE OF SULPHONAMIDES IN MEASLES. ROBERT SWYER, Brit. J. Child. Dis. **40**:63 (July-Sept.) 1943.

Eleven hundred and ninety-three cases of measles occurring in the 1940-1941 epidemic were studied. Three hundred and twenty-four patients received either sulfanilamide or sulfapyridine for a short period immediately after admission to the hospital; 869 did not unless complications arose necessitating the use of these drugs for treatment.

The complication rate was reduced from 13.7 per cent to 11.4 per cent, the average length of stay from twelve and two-tenths to ten and eight-tenths days. The case mortality of bronchopneumonia was approximately halved.

The author concludes that a short course of prophylactic treatment is not worth while.

LANGMANN, New York.

AGE FOR DIPHTHERIA IMMUNIZATION IN SOUTH AFRICA. N. L. MURRAY, South African M. J. **17**:334 (Nov. 13) 1943.

Since 1921 the incidence of diphtheria in South Africa has more than trebled. In 1941 there were 3,317 cases reported and 130 deaths. Many of the patients were below the age of 1 year, and 50 per cent were under 5 years. Half the total deaths from diphtheria, of Europeans at any rate, occur by the fourth year of life. One reason for this state of affairs is that the majority of the persons being immunized are of late preschool age or of school age; another reason is that not nearly enough susceptible persons are being immunized. Alum-precipitated toxoid in two doses with an interval of four weeks between doses is recommended for all children. The earlier the inoculation after the age of 6 months the better. For adults a preliminary Schick test with a Moloney test simultaneously is advisable. Immunization of adults can be done in selected instances with Ramon's anatoxin (three injections) or with alum-precipitated toxoid (two injections, as for children).

GONCE, Madison, Wis.

THE SIGNIFICANCE OF C. DIPHTHERIAE GRAVIS IN THE EPIDEMIOLOGY OF DIPHTHERIA. J. F. MURRAY, South African M. J. **17**:337 (Nov. 13) 1943.

Murray summarizes the significant features of the three strains of Corynebacterium diphtheriae (mitis, intermedius and gravis) in the epidemiology of diphtheria.

GONCE, Madison, Wis.

Acute Infectious Diseases

THE TREATMENT OF AMOEBIC DYSENTERY. HORACE W. SOPER, Am. J. Digest. Dis. **10**:407 (Nov.) 1943.

The author pleads for the use of the intravenous rather then the subcutaneous or the intramuscular route in the administration of emetine hydrochloride. He states the belief that he accomplishes more by giving ½ grain (0.03 Gm.) intravenously daily for seven days than do others by giving 1 grain (0.06 Gm.) subcutaneously or intramuscularly daily for twelve days.

Following seven consecutive daily intravenous doses of emetine hydrochloride, a seven day course of acetar-

sone is given. This consists of one 0.25 Gm. tablet of acetarsone three times daily, before meals.

MORRISON, Savannah, Ga.

ALLERGIC MANIFESTATIONS IN ATOPIC INDIVIDUALS FOLLOWING INJECTION OF TETANUS TOXOID. HARRY SWARTZ, J. Allergy **14**:544 (Nov.) 1943.

The author reports on 2 adults, a man and a woman, in whom a reaction developed following the injection of fluid tetanus toxoid. In the man an erythematous pruritic papular eruption developed and persisted for two years, until hyposensitization was tried with a beginning dose of 0.1 cc. of 1:10,000 solution of tetanus toxoid.

The patient's skin welted when scratched, and he gave a history of having had dermatitis due to ivy. There was a prominent history of allergy in his family.

The woman had severe pruritus after a second injection of fluid toxoid. The symptoms decreased gradually after several months. There was a history of subclinical allergy in the patient and in her family.

HOYER, Cincinnati.

ANAPHYLAXIS AFTER INJECTION OF TETANUS TOXOID. WALTON M. EDWARDS, J. Allergy **14**:552 (Nov.) 1943.

Edwards reports a case of anaphylactoid reaction following the third injection of fluid toxoid.

The patient had a severe cutaneous reaction to four brands of fluid toxoid and to peptone beef heart extract and veal infusion. A peptic meat digest and veal infusion were ingredients of the toxoid he had received.

HOYER, Cincinnati.

OBSERVATIONS ON TETANUS IMMUNIZATION: THE DOSAGE OF ALUM-PRECIPITATED TOXOID AND THE USE OF FLUID TOXOID AFTER TRAUMA. JOHN J. MILLER JR. and J. B. HUMBER, J. Pediat. **23**:516 (Nov.) 1943.

With the production of tetanus antitoxin as a measure of potency, alum-precipitated tetanus toxoid was found superior to fluid tetanus toxoid. The question arises: Should two or three injections of alum toxoid be given?

A comparison was made of the tetanus antitoxin titers attained in two groups of infants and little children. The first group, 68 children, received two injections of 1.0 cc. each of combined alum-precipitated diphtheria and tetanus toxoid during a minimum interval of eight weeks followed by a third injection of 0.5 cc. of alum-precipitated tetanus toxoid at least sixteen weeks later. The second group, 93 children, received the first two injections but not the third.

Antitoxin titrations were performed on several occasions in each group for a year after completion of the immunization. All children in both groups tested two to four weeks after completion of their injections produced at least 0.1 unit of tetanus antitoxin. At this time only one of 39 children who had received three injections showed less than 1.0 unit of antitoxin. In the other group 20 of 46 exhibited titers under 1.0 unit. Thereafter the median antitoxin level dropped more rapidly in the "two injection" group. Between nine and fifteen months after completion of the injections the principal difference in the two groups was the proportion of children with levels of antitoxin above and below the 0.1 unit level. This difference greatly favored the group of children who had received three injections.

Hall has shown, and others including ourselves h confirmed, that basic immunity is conferred by injections of alum-precipitated toxoid. Basic immu then, is all that is desired providing that tetanus to will be administered at the time of trauma and that basically immunized persons respond to this "boos injection rapidly. If, however, the intent of the munizing procedure is to protect the subject comple against tetanus for a given period, even when rein tion is unintentionally omitted after trauma, the quan of circulating antitoxin becomes of great importa Therefore, a course of injections which result in maintenance of levels above 0.1 unit for a year w seem advisable. Annual reinjection would also indicated.

Comparative studies on the type and dose of to to be used for "booster" injections at the time trauma can readily be made. Data concerning speed of antitoxin production following reinjections alum-precipitated and of fluid toxoid was available the groups of children discussed. The basic course immunization consisted of the two or three injecti of alum-precipitated tetanus toxoid. Reinjections w given twelve to fifteen months after the last injec of the basic course. One cubic centimeter of fl toxoid and 0.5 cc. of alum-precipitated toxoid were doses used. Blood for antitoxin titrations was obtai at the time of reinjection and usually four, five or se days later. The range of antitoxin levels at the t of reinjection was comparable in the two groups. T average increase among the children in the group gi fluid toxoid four or five days after reinjection was t fold, whereas among the group receiving alum-preci tated toxoid it was fivefold. Seven days after re jection the average increase in the group given fl toxoid was one hundred fold, as compared with fo fold in the group receiving alum-precipitated toxo

MILLER JR., San Francisco.

POTENTIALITIES IN THE SCHOOL FOR RHEUMATIC FE CONTROL. GEORGE M. WHEATLEY, New York St J. Med. **43**:1947 (Oct. 15) 1943.

This is part of a symposium on rheumatic fever.

Teachers should be instructed in the detection of i ness in children. There should be regular medi supervision of children known to have cardiac disea and expert cardiac consultation services should be p vided.

AIKMAN, Rochester, N. Y.

SULFAPYRIDINE FASTNESS IN A CASE OF PNEUMOCO CIC MENINGITIS. CLARK S. SHUMAN, New Yo State J. Med. **43**:2087 (Nov. 1) 1943.

This 3 year old girl with type XVIII pneumococ meningitis of unknown origin at first responded to s then became resistant to sulfapyridine. Rabbit ser was given, but the child died on the twenty-fifth d There was no autopsy report.

AIKMAN, Rochester, N. Y.

ACUTE ASCARIASIS IN CHILDREN. P. B. FERNAN and S. BALASINGHAM, Indian J. Pediat. **10**:1 (Oct.) 1943.

Ascariasis is widespread and is an important fact in juvenile health in Ceylon. It ranked sixth in i portance in causes of admission to Lady Ridgew Hospital for Children in Colombo and third in cau of death. Girls were affected more often than bo The symptoms may be negligible, or they may simul acute intestinal infection, acute conditions within

omen, cerebral disease or acute respiratory disease. e symptoms are most apt to be due to absorption toxic products from dead rather than live worms. mplications may be due to the migratory activities the worms.

TENNEY, Madison, Wis.

ACKWATER FEVER. T. E. WILSON, M. J. Australia **2**:414 (Nov. 20) 1943.

The author reports 2 cases of blackwater fever in ich recovery was seemingly induced by alkalinization the urine (to inhibit the deposition of acid hematin the renal tubules), repeated blood transfusion (to vent anoxic changes in the renal tubules and to intain the filtration pressure in the kidneys), admin- ation of large amounts of fluid by mouth and intra- ously and temporary avoidance of antimalarial drugs.

GONCE, Madison, Wis.

Chronic Infectious Diseases

APHARSEN IN THE TREATMENT OF CONGENITAL SYPHILIS. GIRSCH D. ASTRACHAN and VAN ALSTYNE CORNELL, J. A. M. A. **121**:746 (March 6) 1943.

Astrachan and Cornell consider mapharsen a good g for use in treatment of late congenital syphilis and interstitial keratitis. Dr. John E. Rauschkolb in discussion of this paper disagrees with the authors to the usefulness of mapharsen in treatment of in- stitial keratitis.

Astrachan and Cornell believe that 0.75 mg. per kilo- m of weight should be the maximum dose for ients with any form of congenital syphilis. It is s toxic to children than to adults and can be given ramuscularly to selected patients if all attempts at ravenous therapy have failed.

In 7 of 10 cases of early congenital syphilis the ient's serologic reaction was reversed partly or com- tely after an average of seventeen and three-tenths ections of mapharsen had been administered.

HENSCHEL, Denver.
[ARCH. DERMAT. & SYPH.]

TREATMENT FOR PEDICULOSIS CAPITIS. WILLIAM A. DAVIS, J. A. M. A. **123**:825 (Nov. 27) 1943.

A lotion containing 40 per cent of the monophenyl er of ethylene glycol, 30 per cent of ethyl alcohol, per cent of water and 5 per cent of methyl salicylate s proved to be satisfactory for the treatment of diculosis capitis. This preparation rapidly kills lice d nits; it costs little, and it is not irritating.

HENSCHEL, Denver. [ARCH. DERMAT. & SYPH.]

ACRO- AND MICROGLANDULAR CASEATION IN PRIMARY TUBERCULOSIS IN CHILDREN. STEFEN ENGEL, Brit. J. Child. Dis. **40**:104 (Oct.-Dec.) 1943.

A curve representing the age incidence of tuberculous ningitis reaches its peak in the second year. Tuber- ous meningitis complicates a much higher percentage the few tuberculous infections occurring in early ldhood than of the many infections in later years.

In children up to 3 to 4 years the bronchial glands d to be large, caseous and numerous. Not only are se glands which drain the site of the primary focus eated, but also some or many others on the same side on the other side. In older children the reverse is case. The infection is confined to the regional glands the majority of cases, and even these few glands main small.

Early age gives rise to this particular type of glandular involvement, and this condition, again, may favor secondary spread. The author designates these two types of glandular response as macroglandular and microglandular caseation.

Tuberculous infection in young children is by no means always fatal. There may be a benign and a malignant form of primary tuberculosis.

There is the early period of infancy (up to the sixth or the eighth month), when almost invariably a fatal spread or gross pulmonary tuberculosis occurs. Thereafter comes the period of macroglandular response, up to the third or fourth year, the incidence decreasing as the age increases within this period. As soon as the child approaches school age the tendency to macroglandular tuberculosis diminishes and it occurs only exceptionally.

LANGMANN, New York.

DELAYED TUBERCULIN REACTION. MARC DANIELS, Lancet **2**:600 (Nov. 13) 1943.

A number of persons who failed to react to either of the initial injections of tuberculin (0.1 cc. each of a 1:10,000 and a 1:100 dilution of old tuberculin) showed a reaction at the site of the last injection of tuberculin (1:100) several weeks after the initial tests. The reaction was of the same character as that of the reaction normally visible in positive reactors forty-eight to seventy-two hours after the injection of tuberculin.

It was assumed that the delayed reaction occurred shortly after an infection and that the reaction to tuberculin still present in the skin occurred at the time tuberculosensitivity reached a definite level.

The author propounds the question whether in these cases tuberculin was retained in the tissues in the absence of previous infection or the infection had occurred before the last injection of tuberculin and allergy had developed to a degree high enough for the antigen fraction of the tuberculin to be fixed intracellularly but not yet high enough to produce a typical reaction.

The author cites 14 instances of delayed reaction in persons who presented themselves for retesting six months after a previous negative reaction.

LANGMANN, New York.

Diseases of Blood, Heart and Blood Vessels and Spleen

ON THE CONSTITUTION OF PROTHROMBIN. ARMAND J. QUICK, Am. J. Physiol. **140**:212 (Nov.) 1943.

Experimental findings are presented which indicate that prothrombin is composed of calcium and two other separate components, designated A and B. Component A disappears from oxalated plasma when the latter is stored in a refrigerator; it is presumably destroyed by oxidation. It is heat labile and to a certain degree group specific. In unmodified plasma it does not diminish, and therefore it can be concluded that component A when present in the intact prothrombin complex is stable. Component B disappears in the plasma of animals poisoned with dicoumarin (3,3'-methylenebis [4-hydroxycoumarin]). It is heat labile and is completely removed from oxalated plasma by aluminum hydroxide. This absorbent does not remove the factor from unmodified plasma; this indicates that when it is combined in the prothrombin complex it is not absorbed.

Views on the use of stored plasma for transfusion must be modified. Heretofore such plasma was considered unsuitable for treating hypoprothrombinemia. Since stored plasma loses only component A and as only component B is depleted in dicoumarin poisoning,

the employment of stored plasma should be as effective as that of fresh plasma.

At present all the cases of clinical hypoprothrombinemia appear to be caused by deficiencies of component B. Although depletion of component A has been observed only in vitro, it is entirely probable that clinical hypoprothrombinemia due to lack of this factor may occur.

NOURSE, Cleveland.

CONSTRICTING DOUBLE AORTIC ARCH: REPORT OF A CASE. PETER A. HERBUT and THOMAS T. Smith, Arch. Otolaryng. **37**:558 (April) 1943.

A case of constricting double aortic arch incompatible with prolonged life is reported. A recognition that such a condition is possible, supplemented by a suitable roentgenographic study, offers diagnostic possibilities. It is hoped that a successful surgical procedure will be developed.

GREENWOOD, Chicago.

A CAUTION AGAINST TOO LIBERAL USE OF CITRATED BLOOD IN TRANSFUSIONS. JACQUES BRUNEAU and EVARTS A. GRAHAM, Arch. Surg. **47**:319 (Oct.) 1943.

In order to demonstrate that transfusions of blood treated with sodium citrate are not entirely innocuous when the material is injected in large quantities the authors carried on experimental transfusions in dogs, using citrated blood and heparinized blood. It was found that the dogs bled repeatedly and continually given transfusions of citrated blood survived a much shorter time than controls receiving heparinized blood. The difference seems to be due to the toxic action of large amounts of sodium citrate. The clinical application of these experimental results is difficult. The authors feel that it is impossible to establish the safe amount of citrated blood to be given in a certain period but do warn against the too liberal use of large amounts of citrated blood over a very short time.

KAISER, Rochester, N. Y.

TECHNIC OF INTRAVENOUS INJECTION IN INFANTS. MANDEL L. SPIVEK, Illinois M. J. **84**:323 (Nov.) 1943.

According to Spivek, giving a transfusion to an infant is not difficult if the method and apparatus used are subordinated to the successful insertion of the needle into the vein and maintenance of it there. Two technics are available: the less certain method of penetration of the skin and vein with a sharp needle and the more reliable method of exposure of the vein by dissection and insertion of a blunt needle. The first or sharp method appears to be the simpler of the two, but in actual practice it is the more difficult and frequently carries a higher percentage of failure. The percentage of failure varies directly with the skill and experience of the operator. The technics of the two methods are described in detail.

BARBOUR, Peoria, Ill.

INDICATIONS FOR BLOOD TRANSFUSION AND FOR THE INTRAVENOUS USE OF SALINE AND NUTRIENT SOLUTION. JAMES D. MCKINNEY, Illinois M. J. **84**:324 (Nov.) 1943.

The indications for blood transfusions are loss of whole blood or any of its constituents from the circulation, inability on the part of the body to supply adequately the constituents of blood and need for stimulation or for the addition of immune substances. In considering the indications for the choice of saline solutions or of nutrient fluids one must consider the deficiency from which the child is suffering.

BARBOUR, Peoria, Ill.

CHLOROLEUKEMIA: REPORT OF A CASE. RAFAEL DE PORTILLA LAVASTIDA, Bol. Soc. cubana de ped. **15**:121 (March) 1943.

The author reports a case of acute leukemia with painful symmetric chloroma-like masses in both lower extremities. Roentgenograms (which are not reproduced) revealed widespread periostitis and subperiosteal lesions resembling those seen in scurvy. The frequency of subleukemic and aleukemic varieties associated with chloroma is stressed, as is the importance of roentgenologic studies of bones in cases of leukemia.

KEITH, Rochester, Minn.

Diseases of Nose, Throat and Ear

EMOTIONAL DISTURBANCES FOLLOWING UPPER RESPIRATORY INFECTIONS IN CHILDREN. HELEN G. RICH, Am. J. Psychiat. **100**:387 (Nov.) 1943.

Between December 1940 and the time the report was written the author observed and treated 12 children with diffuse emotional disturbances that followed infections of the upper respiratory tract. In each case a supposedly normal child had suffered from an illness previously diagnosed as "flu," "grip," "cold" or "tonsillitis." The infectious phase was mild, and its duration was short, ranging from a few hours to a week. In each child there occurred a well defined change in personality within a month after the onset of the disease.

The emotional disturbances consisted of compulsive, obsessive, phobic thinking and behavior. The initial phase presented features similar to those of quasi-delirium, motor restlessness, apprehension and lability of mood. The next phase was marked by heightened anxieties and a depressive mood with the apparent onset of compulsions and obsessions of various duration. Subsequently the children withdrew from their everyday interests. At first the withdrawal was from the less familiar and the more recently acquired expressions of socialization; later it was from the more superficial interpersonal relationships and finally contact with familiar persons was severely disturbed.

The author stresses the importance of the type of personality of the child as a factor in these disturbances. In every instance the child was described as subservient, docile, cowed by authority, perfectionistic in his strivings and meticulous in his personal habits. The conforming attitudes masked underlying capacities for psychopathologic manifestations.

The author postulates that with illness hidden hostile and aggressive thoughts became manifest and dominated and the children attempted to cope with them by anancastic behavior. With psychotherapy these children reestablished themselves in their society with better adjustment than they had had prior to the onset of illness.

JAHR, Omaha.

EOMYELITIS OF THE SKULL RESULTING FROM INFECTION IN THE SINUSES. W. LIKELY SIMPSON, Arch. Otolaryng. **37**:463 (April) 1943.

ighteen illustrative cases are reported. The author ommends thorough removal of the primary focus nfection and wide removal of osteomyelitic bone as best means of preventing complications such as ingitis and abscess of the brain.

GREENWOOD, Chicago.

AL USE OF SULFATHIAZOLE FOR ACUTE PHARYNGEAL NFECTIONS. MARVIN S. FREEMAN, Arch. Otolaryng. 37:496 (April) 1943.

study of 34 patients with acute infection of the rynx or of the nasopharynx introduced a new hod of locally treating the pharyngeal mucosa with athiazole. The method rapidly produces subjective objective relief and materially shortens the course the disease. The possibility of systemic damage n the use of sulfathiazole is negligible with this hod of treatment.

GREENWOOD, Chicago.

NICAL NOTES: A NEW METHOD FOR REMOVING WAX FROM THE EAR. FRANCIS L. WEILLE, Arch. Otolaryng. **37**:722 (May) 1943.

new method for removing cerumen from the ear he use of a metal suction tip with strong negative ssure; up to 25 pounds (11.3 Kg.) of suction may used.

GREENWOOD, Chicago.

UTE AND CHRONIC MASTOIDITIS: CLINICAL ANALYSIS OF FIVE HUNDRED AND TWENTY-SIX CONSECUTIVE OPERATIONS. CHARLES EMORY TOWSON, Arch. Otolaryng. **38**:32 (July) 1943.

survey of 526 consecutive operations for acute and onic mastoiditis is presented. Most of the operations acute mastoiditis were performed during the second fourth weeks of infection. Hemolytic streptococci e the predominant organisms, and most patients h acute mastoiditis had a leukocyte count of between 00 and 18,000. Cholesteatoma in nearly 50 per cent he patients was found to be an indication for radical toidectomy. Of 205 patients with acute surgical toiditis, 98 per cent had dry ears; of 123 patients h radical mastoiditis, 90 per cent had dry ears. The dual hearing after radical operations was as good he preoperative hearing or better in 63.8 per cent he 94 patients for whom there were no follow-up ords. The improvement apparently depended some- t on the duration of otorrhea before operation but independent of the healing time.

GREENWOOD, Chicago.

UNUSUAL NASAL TUMOR. BERT. E. ELLIS, Arch. Otolaryn. **38**:65 (July) 1943.

n unusual type of adenocarcinoma in a 12 year old d is reported as cured with no recurrence after two rs. The author believes that the area of such a or can be thoroughly cleaned without resulting ex- sive deformity by an external ethmoidectomy, a dwell-Luc operation and an intranasal operation bined. It is thought that the first procedure should removal of the bulk of the tumor; at a second opera- the base of the tumor may be more successfully terized, because of hemostasis.

GREENWOOD, Chicago.

LOCAL TREATMENT OF ACUTE RHINITIS WITH SULFATHIAZOLE. EVAN EBERT, Arch. Otolaryng. **38**:324 (Oct.) 1943.

The author found that local treatment of acute rhinitis with insufflation of sulfathiazole proved effective, with no toxic effects of the drug and no complications. All age groups treated were between the ages of 1 and 81 years. However, it was felt that it is too early to draw any definite conclusion as to the value of therapy, because the number of patients thus far treated has not been large enough to justify conclusions.

GREENWOOD, Chicago.

ATRESIA OF THE EXTERNAL AUDITORY CANAL. LEE COHEN and SAMUEL FOX, Arch. Otolaryng. **38**:338 (Oct.) 1943.

Acquired atresia (complete) of the external auditory canal is rare. Operative intervention is the only therapy, and the results are good. Congenital atresia of the external auditory canal occurs more frequently than is generally supposed. It is usually associated with microtia and other deformities of the external and the middle ear and therefore presents more problems. The unilateral type is best left alone, as the hearing is usually fairly good and operation at best offers only a moderate improvement in hearing and is usually attended by a poor cosmetic result. Patients with bilateral atresia should be operated on at an early age, because a handicapping loss of hearing is always present. It is the opinion of the authors that an operation analogous to the one described for traumatic atresia should be done rather than a radical mastoidectomy, as the latter is an unphysiologic attempt to convey sound waves to the middle ear and is attended by more risk than its uncertain results justify.

GREENWOOD, Chicago.

PATHWAY OF THE TONSILLAR LYMPHOCYTE. GEORGE KELEMEN, Arch. Otolaryng. **38**:433 (Nov.) 1943.

The purpose of this article is to show the life history and ultimate fate of the tonsillar lymphocyte. The movements of the tonsillar lymphocyte represent in their entirety a passive transportation along preformed highways. The mobile elements in the germinal or action center are driven by increased intranodular pressure into the meshes of the reticulum. Portions of the reticulum penetrate into the layers of the epithelial cells. The projections of the reticulum carry the mobile elements within themselves. Increasing pressure causes these structures to expand and rupture the epithelium, so that the cells are convened into the lumen of the crypt. Here they are carried along threads of fibrin to reach the mouth of the crypt and are helped to reach the free surface of the tonsil by a tuftlike disposition of fibrinous fibrils. Changes in pressure initiated in the blood vessels of the capsule are responsible for formation of the secondary nodule and transportation of the mobile elements.

GREENWOOD, Chicago.

MUCOCELE OF THE FRONTAL SINUS: A REPORT OF FIVE CASES IN TWO OF WHICH AT OPERATION THE MUCOCELE WAS FOUND TO BE EMPTY. W. J. MCNALLY, E. A. STUART and A. E. CHILDE, Arch. Otolaryng. **38**:574 (Dec.) 1943.

An unusual circumstance in 5 cases of mucocele reported is that in 2 cases the mucocele was found empty at operation. There is no clinical method of determin-

ing without operation whether such a sinus is empty. Roentgenograms are a valuable adjunct in diagnosis. Photographs are presented.

GREENWOOD, Chicago.

MASTOIDITIS, MENINGITIS AND ABSCESS OF THE TEMPOROSPHENOIDAL LOBE. LESTER L. COLEMAN, Arch. Otolaryng. **38**:590 (Dec.) 1943.

Described here is a case of mastoiditis, meningitis and abscess of the temporosphenoidal lobe. It illustrates the masking effects of sulfonamide compounds on otogenous infection and the surgical approach to the meninges by multiple incisions of the dura at the time of mastoidectomy. It further illustrates the value of sulfonamide compounds after the surgical focus has been adequately and thoroughly removed.

GREENWOOD, Chicago.

OTOSCLEROSIS IN IDENTICAL TWINS. HARRY C. ROSENBERGER, Arch. Otolaryng. **38**:594 (Dec.) 1943.

A report of identical twins with otosclerosis points to heredity as a factor.

GREENWOOD, Chicago.

PATULIN IN THE COMMON COLD: COLLABORATIVE RESEARCH ON A DERIVATIVE OF PENICILLIN PATULUM BAINIER. HAROLD RAISTRICK and others, Lancet **2**:625 (Nov. 20) 1943.

Patulin (a derivative of Penicillium patulum Bainier) was found to be about equally bacteriostatic to both gram-positive and gram-negative organisms. It was much less active than penicillin against gram-positive organisms but much more active against gram-negative organisms.

During four months patulin was given a trial in the treatment of common colds prevalent at a naval establishment. Solutions of the substance were sprayed in the nose or snuffed up from the hand. The results obtained were encouraging; 57 per cent of the treated patients recovered completely in forty-eight hours, compared with only 9.4 per cent of the controls.

LANGMANN, New York.

UPPER RESPIRATORY TRACT INFECTIONS. F. M. BURNET, M. J. Australia **2**:393 (Nov. 13) 1943.

Burnet presents an excellent discussion of infections of the upper respiratory tract. The material is considered under the following headings: (1) the etiology of the common infections of the respiratory tract, (2) the experimental study of influenza, (3) the recent incidence of influenza in Victorian camps, (4) the pathogenesis of influenza and (5) the control of infections of the respiratory tract. In the discussion of the last-mentioned aspect of the subject Burnet states that two pronouncements can be made. The first is that a large proportion of the winter respiratory and pharyngeal infections are not influenzal but are due partly to viruses not yet isolated and partly to bacterial pathogens. No immunologic approach to the control of these infections is yet possible. In the second place, it can be stated that in a clearcut epidemic of virus influenza, the evidence suggests that immunization of susceptible persons either by subcutaneous inoculations of formaldehyde-killed virus or by intranasal administration of living attenuated virus will reduce the incidence to a moderate degree; but no method has yet been conclusively proved to be effective, and the most that has been claimed is a 50 per cent reduction in morbidity. Such a moderate degree of success may conceivably make it worth w to immunize large groups of persons engaged in im tant work, but it is hardly sufficient to suggest immunization would be worthy of general applica Smorodintseff's report of protection of persons exp to an epidemic by inhalation of immune serum in form of a mist should be treated with reserve the experiments have been repeated. It is not unli that some modification of his method may become best practical means of protection against influenz the midst of an epidemic. It is always possible th specific chemotherapeutic agent will be discovered will render all immunologic methods obsolete. If a demic of the 1918-1919 type should reappear, it wil a matter of major human importance to know whe the fatal outcome is essentially due to bacterial ac and hence to be prevented by the use of sulfona drugs or whether the damage due to the virus is i sufficient to cause death. In the latter circumstance chemotherapeutic agent at present known would b any value.

GONCE, Madison, Wi

Diseases of Lungs, Pleura and Mediastinu

SUPPURATIVE ANTERIOR MEDIASTINITIS IN AN IN FOLLOWING INTRASTERNAL BLOOD TRANSFUS MARK M. RAVITCH, Arch. Surg. **47**:250 (Sept.) 1

An 8 month old Negro girl after several infecti was given an intravenous transfusion and several d later an intrasternal injection of blood. The follow day there developed fever, dyspnea and obstructio venous return of blood from the head, chest and a manifested by pronounced edema. Fluoroscopic ex ination showed a mass in the anterior mediasti overlying the base of the right ventricle. Aspiratio the mediastinum yielded pus. Recovery followed section of the overlying sternum and costal cartil A discussion on the differential diagnosis of ante and posterior mediastinitis follows.

KAISER, Rochester, N. Y

ROENTGEN THERAPY OF INTERSTITIAL PNEUMO ALBERT OPPENHEIMER, J. Pediat. **23**:534 (N 1943.

Interstitial pneumonia of children, characterized infiltration around the bronchi and bronchioles with obstruction of the air passages and consequently w out atelectasis, is akin to virus pneumonia of adults does not seem to respond to the usual medical treatm Good results were obtained by means of roent therapy with small doses and intermediate penetrati Both the penetration and the individual roentgen d must be adapted to the age of the child, the dura of the disease and sundry other factors. Doses exc ing 100 roentgens, given during the acute stages, resu in severe constitutional reactions including chills convulsions. No by-effects were observed with d between 35 and 60 roentgens. As a rule, the clin signs and symptoms subsided within one day or a days after the first treatment, irrespective of the previ duration of the disease. Most of the patients rece a single treatment.

OPPENHEIMER, Laconia, N. H

THE COLD AGGLUTINATION TEST IN THE DIAGNOSIS PRIMARY ATYPICAL PNEUMONIA. GORDON MEI JOHN, Proc. Soc. Exper. Biol. & Med. **54**: (Nov.) 1943.

Serums from 74 patients with primary atypical p monia and serums from 101 patients with various

es (pneumonia, mostly pneumococcic, tuberculosis, e A influenza, infection of the upper respiratory ct and lymphogranuloma venereum) as well as um from 36 normal persons were tested for cold lutinins. Sixty of the 74 patients with atypical umonia had titers of 20 or above, and three fifths of m had titers of 40 or above. The latter were con- ered definitely abnormal, as none of the patients from control groups had titers which were greater than 20. ring the first week only one fifth of the titers became itive, the rise began after eight to ten days of illness, ched a peak between the twelfth and the twenty- h day and fell off rapidly after the thirtieth day. ere was no relation between the titer for cold aggiu- ins and the severity of the disease, but transmission the infectious agent from patients with primary pical pneumonia to cotton rats occurred most fre- ntly from those whose blood contained cold aggiu- ins.

HANSEN, Minneapolis.

Diseases of the Gastrointestinal Tract, Liver and Peritoneum

REIGN BODY, JACKSTONE, IN THE ESOPHAGUS; PER- FORATION; MEDIASTINITIS; RECOVERY. HARRY L. BAUM, Arch. Otolaryng. **38**:502 (Nov.) 1943.

This case illustrates the wisdom of leaving a foreign dy in place in the esophagus for a time under special cumstances. The complication of esophageal perfora- n with mediastinitis and the eventual recovery with- mediastinotomy are somewhat unusual. The case ther demonstrates the fact that it is sometimes pos- le to withhold mediastinotomy and still achieve a cessful result. External drainage was not necessary this case—a fact which is not true in every case. cause of the fact that this patient's condition was orable, it was not necessary to do mediastinotomy, d therefore that very serious procedure was avoided.

GREENWOOD, Chicago.

JUNAL INTUSSUSCEPTION. EDWIN PAUL SCOTT, J. Pediat. **23**:565 (Nov.) 1943.

Jejunal intussusception in a newborn infant is re- rted. An operation was performed on the sixth day life, but the infant died on the seventh postoperative y.

This is believed to be the fourteenth instance reported intussusception and the second of jejunal intussuscep- n in a newborn infant.

SCOTT, Louisville, Ky.

APHRAGMATIC HERNIA OF THE COLON IN AN INFANT WITH MONGOLISM. T. VALLEDOR and D. G. TEJERA, Bol. Soc. cubana de pediat. **15**:51 (Feb.) 1943.

A case of diaphragmatic hernia in a mongolian idiot d 1 year is reported. The hernia was through the tus of Morgagni into the anterior mediastinum, and authors feel that it was in part due to hypotonia of diaphragm. Clinically the child had attacks of hyxia and cyanosis, most marked in the supine ition and at times accompanied by severe cough and er. Roentgenologic examination showed that part the transverse colon was in the right hemithorax.

KEITH, Rochester, Minn.

Nervous Diseases

ELECTROENCEPHALOGRAMS IN POST TRAUMATIC EPI- LEPSY: PRE-OPERATIVE AND POST-OPERATIVE STUDIES. HERBERT JASPER and WILDER PENFIELD, Am. J. Psychiat. **100**:365 (Nov.) 1943.

Jasper and Penfield present a general discussion of the problem of post-traumatic epilepsy and its differential diagnosis from essential epilepsy.

Eighty-six cases were analyzed with particular reference to the localization of the abnormal electrical discharges. Preoperative and postoperative studies were made on 32 patients on whom operations had been performed for the removal of epileptigenic lesions.

The electroencephalograms provide strong evidence that the technic of excision used by the authors is satisfactory. The gyri are completely, not partially, removed, and the pial covering of the remaining gyri is preserved.

JAHR, Omaha.

DIFFUSE LEUKOENCEPHALOPATHY WITHOUT SCLEROSIS. HERMAN JOSEPHY and BEN W. LICHTENSTEIN, Arch. Neurol. & Psychiat. **50**:575 (Nov.) 1943.

The authors described 2 cases of a progressive, deteriorative, fatal disease of the central nervous system in which there was diffuse leukoencephalopathy without sclerosis.

BEVERLY, Chicago.

RECOVERIES FROM STAPHYLOCOCCIC MENINGITIS FOLLOW- ING THERAPY. WARD J. MACNEAL, FRANCIS C. FRISBEE and ANNE BLEVINS, Arch. Otolaryng. **37**: 507 (April) 1943.

The authors relate that in the ten years they have given to bacteriophage service there have been 11 recoveries from staphylococcic meningitis. The recovery may be achieved by the skilful use of bacteriophage without accessory therapy. However, this disease is in any case dangerous, and administration of a sulfonamide compound, especially sulfathiazole or sulfapyridine, is recommended with bacteriophage therapy. Eight clinical charts illustrate the article.

GREENWOOD, Chicago.

GUILLAIN-BARRÉ SYNDROME (ACUTE INFECTIVE POLY- NEURITIS) WITH INCREASED INTRACRANIAL PRESSURE AND PAPILLEDEMA. F. R. FORD and F. B. WALSH, Bull. Johns Hopkins Hosp. **73**:391 (Nov.) 1943.

Two cases of this syndrome are reported in which, in addition to the characteristic features of the disease, increased intracranial pressure and papilledema were present. A review of the literature shows few references to papilledema in reports of acute infective polyneuritis.

LYTTLE, New York.

THE GUILLAIN-BARRÉ SYNDROME. R. FINLEY GAYLE and DALE GROOM, J. Nerv. & Ment. Dis. **98**:488 (Nov.) 1943.

Gayle and Groom review briefly the literature and the characteristic clinical picture of the Guillain-Barré syndrome. They report the case of a 4 year old child in whom complete flaccid quadriplegia, paralysis of the left abducens nerve, distended bladder, generalized hyperesthesia and absence of deep reflexes appeared three or four days after apparent recovery from an

infection of the upper respiratory tract, in December 1942. A spinal tap on the fourth day in the hospital revealed 4 cells per cubic millimeter and a total protein content of 120 mg. per hundred cubic centimeters. Treatment according to the Kenny method was instituted, with local hot applications, manipulations, massage, exercises and use of removable casts. Recovery was progressive, and by September 1943 only some residual weakness and atrophy of the lower extremities remained. The authors believe the Kenny method to be of value in the treatment of this condition.

CHODOFF, Langley Field, Va.
[ARCH. NEUROL. & PSYCHIAT.]

PNEUMOCOCCAL MENINGITIS: RECOVERY FOLLOWING TREATMENT WITH SULFADIAZINE AND SPECIFIC ANTISERUM: REPORT OF A CASE. JAMES H. YOUNG, CHARLES SCHLOSBERG, CHARLES N. GETTES and SALVATORE A. MANCONI, New England J. Med. **229**:716 (Nov. 4) 1943.

Before chemotherapy became of common use, only in isolated instances was there recovery from pneumococcic meningitis. Prior to the use of the sulfonamide drugs mortalities as high as 95 to 100 per cent were reported. The few scattered recoveries reported may have been due to the use of specific antipneumococcus serum, alone or supplemented by various forms of drainage. With the advent of the newer chemotherapeutic agents the prognosis has become more promising. Some observers have found that the use of serum in combination with the sulfonamide drugs makes the outlook even better than when either is used alone.

A proved case of meningitis due to type V pneumococci with recovery is reported, with the plan of treatment outlined in detail. Both a chemotherapeutic agent and the specific antipneumococcus serum were employed. At no time did it appear advisable to institute surgical intervention on the mastoid.

GENGENBACH, Denver.

WATER-PITRESSIN TEST IN THE DIAGNOSIS OF EPILEPSY. HUGH G. GARLAND, A. PETER DICK and C. W. M. WHITTY, Lancet **2**:566 (Nov. 6) 1943.

For the purpose of diagnosis, fits can often be produced in persons with epilepsy by giving large quantities of fluid by mouth together with injections of pituitary extract containing pitressin. It is claimed that this procedure has never yet produced a fit in a person who is not epileptic. The test appears to be free from risk provided the patients are kept under close observation, are young and, apart from epilepsy, are healthy.

LANGMANN, New York.

TUBERCLES OF THE BRAIN IN THE COURSE OF DISSEMINATED PRIMARY INFECTION IN SMALL CHILDREN. T. VALLEDOR, Bol. Soc. cubana de pediat. **15**:105 (March) 1943.

Four cases of tubercles of the brain in small children are reported, in only 2 of which was the diagnosis confirmed by necropsy. In none of the cases did the spinal fluid show any changes except increase in pressure. The clinical signs were those of acutely increased intracranial pressure, such as vomiting, increased reflexes, positive Macewen's sign, headache and convulsions, but without definite changes in the ocular fundi or typical signs of meningitis.

KEITH, Rochester, Minn.

Psychology and Psychiatry

BREATH-HOLDING SPELLS. EDWARD M. BRIDGE, SAM LIVINGSTON and CHRISTOPHER TIETZE, J. Pe **23**:539 (Nov.) 1943.

Breath-holding spells are common among small c dren. Calculations based on a study of 188 nor children who were brought to a well baby clinic sho an incidence of approximately 46 per cent. Mos such spells are of course mild and give little cause concern to the parents. Among 95,000 children in the Johns Hopkins Hospital there were 83, approximately 0.1 per cent, who presented bre holding spells as a major complaint. Of this gr of 83, 93 per cent showed cyanosis, 60 per cent consciousness and 49 per cent convulsions associa with the breath-holding spells.

Convulsions induced by breath-holding are dis guished from those due to epilepsy by means of a tailed description of the initiating circumstances. the former, anger, pain or fear always precipita crying and breath holding, which in time lead cyanosis and convulsions. In epilepsy, precipitat circumstances are rare and crying, respiratory spas unconsciousness and convulsions begin almost sim taneously.

The background or cause of breath-holding sp involves a variety of factors. Parental mismanage of the child and his habit training leading to episo of violent anger and resentment is observed in a m jority of these cases. In some, however, this is abs and the underlying difficulty appears to be an abnorm physiologic reactivity. In this group the attacks commonly induced by pain rather than by anger or fe Evidences of abnormal vagotonia may be observed some children. Since the unconsciousness and co vulsions associated with breath-holding spells are oft related to the degree and duration of the cyanosis seems likely that the mechanism involved is similar that involved in the various forms of syncope, ordina faints, carotid sinus sensitivity and paroxysmal he block.

The great majority of children with breath-holdi spells "outgrow" them before the end of the third ye of life. In mentally retarded children, the spells te to have a somewhat later age of onset and disappe ance than in children with normal intelligence. follow-up study was made of 41 of the 83 children w were brought to the hospital for breath-holding spe with the average age of almost 11 years. Approximat one third of the group showed behavior problems, b not more than would be expected in a similar gro of normal children. Three children had convulsi unrelated to breath holding; 2 had typical epile and 2 others were suspected of having epilepsy, b the diagnosis could not be established.

BRIDGE, Baltimore.

Diseases of the Genitourinary Tract

URETERITIS: A CLINICAL SURVEY. DUNCAN M. MO SON, Edinburgh M. J. **50**:661 (Nov.) 1943.

The author states that ureteritis is not complet understood. He discusses the anatomy and physiolo of the ureters, including the nerve supply, and t symptoms and causation of the disease. He divi the types of ureteritis into abdominal and pelvic gro as regards the clinical manifestations. The disease clinically definite, though the pathologic changes a

cause are not entirely clear. The lower end of the ter is the site most frequently involved in both es. The condition occurs in children, but less com- nly than in adults.

The treatment consists of ureteral dilation, short ve diathermy and denervation of the ureter.

NEFF, Kansas City, Mo.

Diseases of the Ductless Glands; Endocrinology

OWTH OF THE HUMAN SUPRARENAL GLAND. C. A. SWINWARD, Anat. Rec. **87**:141 (Oct.) 1943.

At three months' gestation the medulla is less than er cent of the total gland. At birth the medulla is per cent of the cortex. The cortex degenerates in first two weeks of postnatal life, so that the total nd decreases 50 per cent in size. The adult cortico- dullary ratio is reached at 3 years of age.

SNELLING, Toronto, Canada..

UDIES ON INACTIVATION OF ESTRADIOL BY THE LIVER. A. CANTAROW, K. E. PASCHKIS, A. E. RAKOFF and L. P. HANSEN, Endocrinology **33**:309 (Nov.) 1943.

t is generally believed that estrogens are rapidly ctivated by the liver, this belief being based largely data obtained from four types of observation: Hepatic tissue and cell-free extracts of liver have n found to inactivate estrogens in vitro. 2. It is orted that estrone is not inactivated when perfused ough a heart-lung preparation but that it is rapidly ctivated when perfused through a heart-lung-liver paration. 3. Ovaries transplanted to the mesentery or lets of crystalline estrogen implanted in the spleen ert little or no estrogenic effect, as compared with characteristic action of ovaries implanted subcu- eously; the same is true of estrogen injected into spleen. 4. Enhancement of the effect of endogenous rogen and of exogenous estrogens introduced into systemic or portal circulations has been observed animals and in human subjects with hepatic damage. owever, the authors state the belief that critical alysis of the reported data reveals that the generally cepted views regarding the influence of the liver in s connection have been based on surprisingly few servations and that there are significant gaps and ntradictions in the chain of evidence that forms the is for these views.

They report experiments showing that little or no tive estrogen can be recovered from the liver of a three to forty-eight hours after intravenous injec- n of 250,000 international units (2.5 mg.) of alpha radiol. Twenty-four and forty-eight hours after injec- n of estradiol large amounts are present in bile from gallbladder but none in the liver, spleen or intes- al wall or in blood from the hepatic vein. The livers rats poisoned with carbon tetrachloride exhibit essen- lly the same capacity as the livers of normal rats inactivating alpha estradiol in vitro. These obser- tions do not support the hypothesis that the increased tivity of endogenous and exogenous estrogen in the esence of hepatic damage is due to decreased inacti- tion of estrogen by the damaged hepatic cells.

The following hypothesis is offered as being in accord th all available data: Estrogen is removed from the ood by the hepatic cells, converted to a substance ssessing little or no estrogenic activity, in part stored mporarily in the liver in this form and "reactivated" during the process of its excretion by the hepatic cells. Estrogen probably undergoes an enterohepatic circulation similar to that of bile acids, being, perhaps, gradually destroyed or converted to a permanently inactive substance.

JACOBSEN, Buffalo.

EFFECT OF ADRENAL CORTICAL COMPOUNDS ON LACTATION. WARREN O. NELSON, ROBERT GAUNT and MALVINA SCHWEIZER, Endocrinology **33**:325 (Nov.) 1943.

Further evidence is presented of the important role played by the adrenal cortex in the initiation and maintenance of lactation. Potent preparations of lactogenic hormone are powerless to induce the secretion of milk in hypophysectomized guinea pigs unless aided by the action of adrenal substance. This aid may be provided with equal effectiveness in the form of hormone produced in the adrenal cortex as the result of stimulation by the adrenotropic factor or directly as adrenal cortex extract supplied by injection. These substances probably act, in part at least, through mechanisms involving both of the well known functions of the adrenal cortex, the actions on salt and water and on metabolism of carbohydrates.

Substances which promote mammary growth in general inhibit lactation. Thus estrogen, a potent stimulant to the growth of the mammary gland, inhibits secretion of milk. The same appears to be true, although from a quantitative standpoint to a lesser degree, of desoxycorticosterone. Such inhibition is probably effected in the hypophysectomized animal by a direct action on the mammary gland and in the normal animal by an effect on the hypophysis as well as on the mammary gland.

JACOBSON, Buffalo.

ENDOCRINE AND PSEUDOENDOCRINE PROBLEMS IN CHILDHOOD. RICHARD WAGNER, New England J. Med. **229**:737 (Nov. 11) 1943.

Rightfully, endocrine and pseudoendocrine problems in childhood deserve consideration together. Many anomalies and disturbances of growth and development and certain instances of retarded sexual development, abnormal accumulation and distribution of fat, dwarfism and even mental retardation are often mistakenly grouped as expressions of endocrine imbalance.

There are three large groups of diseases and anomalies that have certain features in common but that differ from each other in causation and in the dominance of certain characteristics. Group 1 includes the true endocrine disorders caused by pathologic processes or by anomalies of endocrine glands, including congenital absence. Group 2 includes the accentuations of physiologic phases of development, which sometimes imitate true endocrinopathies. Constitutional and familial factors are frequently involved. Temporary states such as transitory infantilism, certain forms of obesity and disharmonic development should be included. Group 3 includes congenital anomalies and multiple deviations and retardation of development, somatic as well as mental, sometimes mistaken for endocrinopathies, and showing some of their essential features. Not infrequently they overlap. Conditions in this group should properly be called genopathies rather than endocrinopathies.

In the physical examination of children with endocrine or pseudoendocrine disturbances special attention should be given to hematologic studies (hypochromic anemia occurs in myxedema), the heart and electrocardiogram (characteristic changes are present in hyperthyroidism and hypothyroidism), the blood pressure (elevation

occurs in adrenocortical obesity with macrogenitosomia) and the size of the liver (hepatomegaly is present in dwarfism due to glycogenosis).

GENGENBACH, Denver.

Diseases of the Eye

SWIMMING-BATH CONJUNCTIVITIS, WITH A REPORT OF THREE PROBABLE CASES AND A NOTE ON ITS EPIDEMIOLOGY. E. H. DERRICK, M. J. Australia **2**:334 (Oct. 23) 1943.

The author reports 3 cases in which inclusion blennorrhea appeared six to seven days after simultaneous exposure of the patients in a swimming pool. In all 3 patients the conjunctivitis was accompanied by severe constitutional symptoms which persisted for five days.

GONCE, Madison, Wis.

Skin Diseases; Allergy

TREATMENT OF TINEA WITH ETHYL CHLORIDE. NATHAN BOGRAD, Arch. Dermat. & Syph. **48**:511 (Nov.) 1943.

The author has found that the method described gives uniformly excellent results, and he has found no contraindications for its use. Ethyl chloride is sprayed on the lesion until the temperature of the skin is lowered sufficiently to produce a white surface. Primary lesions or small grouped lesions with no erythema are sprayed a few seconds longer. If the lesion is a vesicle, the spray is applied to the whole area; if it is a macule or a larger lesion, the spray is applied around the edge, and two to four applications are made, depending on the size. Distant allergic manifestations require only one application to allay itching.

JACKSON, Iowa City.

AN APPRAISAL OF THE PRESENT STATUS OF PROPHYLAXIS AGAINST POISON IVY. FRANCIS A. ELLIS, J. Allergy **14**:557 (Nov.) 1943.

The author reviews the present status of prophylaxis against poison ivy and reports his experience with the use of tablets containing an ethereal extract of poison ivy for 5 patients. Immunity to poison ivy developed in these patients. Pruritus ani, which is an annoying reaction to the treatment, can be relieved by watching the dose and by allowing rest periods during the treatment.

HOYER, Cincinnati.

THE TREATMENT OF WARTS. ARTHUR BURROWS, Brit. J. Dermat. **55**:60 (March) 1943.

The author states that the chief methods of treatment of warts are: (1) general (internal medication and psychotherapy); (2) use of local keratolytics (glacial acetic acid and salicylic acid); (3) use of cautery, diathermy (electrocoagulation) or solid carbon dioxide (the author prefers cautery because of the better cosmetic appearance afterward); (4) excision and curettage (according to the author one of the most satisfactory methods of dealing with warts), and (5) radiologic methods, which include (*a*) superficial irradiation (unscreened or lightly screened rays with a kilovoltage of 80 to 100); (*b*) the Chaoul technic (contact or close therapy with a kilovoltage of about 60); (*c*) grenz rays emitted at about 10 kilovolts, and (*d*) radium.

BLUEFARB, Chicago. [ARCH. DERMAT. & SYPH.]

Miscellaneous

PENICILLIN AS A CHEMOTHERAPEUTIC AGENT. MA... H. DAWSON, GLADYS L. HOBBY, KARL MEYER ... ELEANOR CHAFFEE, Ann. Int. Med. **19**:707 (N... 1943.

Penicillin exhibited strong antibacterial action aga... gram-positive organisms and against gonococci ... meningococci. It was not effective against other gr... negative bacteria. Its action is both bactericidal ... bacteriostatic. It is effective in the presence of ... and inflammatory exudates. Penicillin is nontoxic ... much larger doses than are necessary therapeutic...

READING, Galveston, Texa...

THE PHYSIOLOGICAL BASIS OF PARENTERAL FL... ADMINISTRATION. DONALD E. CASSELS, Illinois ... J. **84**:320 (Nov.) 1943.

The blood volume of a normal child is 85 to 90 ... per kilogram of body weight; it is increased in m... nutrition and in edema and is decreased in obesity ... in dehydration. The volume in infants is low w... related to surface area.

The volume of blood is easily reduced by illn... especially when there is vomiting or diarrhea, and ... reduction interferes with the renal control of the ac... base balance.

While the volume of body fluid may be measur... by laboratory methods, clinical estimation of dehyd... tion continues to be difficult. The weight changes w... the volume of body fluid and this change and ... clinical appearance continue to be the only bedsi... criteria of dehydration available at present.

The volume necessary for normal circulation ... renal function and the content of electrolytes may ... restored by parenteral administration of isotonic so... tion of sodium chloride with 5 per cent dextrose. T... necessary amount may best be judged by the main... nance of weight, by the maintenance of moisture in ... mouth and, best of all, by the maintenance of urin... output.

In circulatory failure or distress subcutaneous fl... is not readily absorbed, and when fluid is administe... intravenously to persons with circulatory distress it ... wise to follow the venous pressure, which may be d... simply.

BARBOUR, Peoria, Ill.

THE PARENTERAL ADMINISTRATION OF VARIOUS THE... PEUTIC AGENTS. ORVILLE BARBOUR and ROBERT ... HART, Illinois M. J. **84**:326 (Nov.) 1943.

This paper is a résumé of the useful and dependab... types of parenteral therapy. The generally accep... indications for this therapy, the interpretations of ... results and the methods commonly used in the adm... istration of the various types of therapeutic agents ... outlined. The intradermal, subcutaneous, intramuscul... intravenous and intraspinal routes of medication ... used by the pediatrician are each discussed.

BARBOUR, Peoria, Ill.

MICROBIOLOGICAL ASPECTS OF PENICILLIN: I. METH... OF ASSAY. JACKSON W. FOSTER and H. BOYD W... RUFF, J. Bact. **46**:187 (Aug.) 1943.

One of the most pressing issues confronting work... engaged in studies of penicillin is the matter of est... lishing with some degree of certainty and accuracy ...

ency of solutions of penicillin. Wide divergencies methods of assay now exist. The authors have mpted to compare the different types of assays. y recommend that unknowns be tested daily with tandard preparation of penicillin of known Florey age to minimize uncontrollable fluctuations. Serial tion methods, with liquid or solid mediums, are ting in accuracy and do not yield specific values penicillin activity. A modified broth method de- d in the Squibb laboratories gives good sensitivity is practical. The turbidimetric method has appli- on in special types of investigations in which high racy is required, but it is too difficult for routine ys. The Oxford cup method (modified) is an ellent method for routine assays, especially for large bers of samples. The article should be consulted the details of the experiments characterizing the erent methods.

STOESSER, Minneapolis.

CROBIOLOGICAL ASPECTS OF PENICILLIN: III. PRO- DUCTION OF PENICILLIN IN SURFACE CULTURES OF PENICILLUM NOTATUM. J. W. FOSTER, H. B. WOOD- RUFF and L. E. MCDANIEL, J. Bact. **46**:421 (Nov.) 1943.

Realizing that an increased interest in penicillin as chemotherapeutic agent would lead to a greater de- nd for the product, the authors made an extensive estigation of the production of this substance. They nd that different strains of Penicillium notatum vary ely in the ability to produce penicillin and that the ction of the most potent strains is of primary im- tance for maximum production. Furthermore, active ains tend to degenerate or lose their capacity to duce penicillin, especially after continued serial nsfer on laboratory mediums. This degeneration can eliminated by reducing the number of vegetative nsfers as described by the authors. Active cultures en plated yield isolates with different degrees of icillin activity. Penicillin is produced when the p_H the medium does not fall to lower than 4 during early stages of growth of the culture and in the r stages rises rapidly to 6.0 to 8.5. . The presence of ces of certain elements, notably zinc, and also of anic supplements, favors the rapid rise in p_H and formation of penicillin. Zinc in particular acts in manner by catalyzing the complete oxidation and lization of dextrose by the mold, thus preventing the umulation of gluconic acid which is responsible for fall in p_H of the medium.

STOESSER, Minneapolis.

"IMPROVED" CONSULTANT'S CASE FOR PEDIATRIC PHYSICIANS. R. A. WILSON, J. Pediat. **23**:568 (Nov.) 1943.

An improved case for pediatric physicians is described. e case itself is of rigid leather "brief case" construc- n. The lid will fasten open at an angle of 90 degrees. e main compartment is subdivided to hold diagnostic truments for the ear, a sphygmomanometer, hemo- binometer and stethoscope. There are also spaces containers for antiseptics, dressings and drugs. The er side of the lid holds a pen, pencil and pen light as well as prescription and memoranda pads. The outer side of the lid has bellows type leather compartments to carry the numerous insurance papers, history forms and diet sheets which modern pediatric practice requires. The case is described as functional rather than traditional.

WILSON, Winnipeg, Manitoba, Canada.

EFFECT OF ORAL ADMINISTRATION OF SUCCINYL SULFA- PYRAZINE ON BACTERIAL (COLIFORM) FLORA OF THE INTESTINE OF NORMAL MICE. FRITZ T. .CALLOMON, J. Pharmacol. & Exper. Therap. **79**:200 (Nov.) 1943.

It was found that succinyl sulfapyrazine "proved highly effective and at least equal to sulfaguanidine in diminishing the density of coliform bacteria in the contents of the intestine of normal mice." Succinyl sulfapyrazine was more effective than sulfasuxidine (succinyl sulfathiazole), and the toxicity was low when the drug was fed to mice in large quantities.

PILCHER, Cleveland.

ON THE MECHANISM OF FEVER PRODUCTION WITH INFLAMMATION. VALY MENKIN, Proc. Soc. Exper. Biol. & Med. **54**:184 (Nov.) 1943.

In a study of the production of fever by inflammatory reaction fractionization of exudates was made and the various fractions were injected intracardiacally into dogs. The only fraction which produced a fever in these animals was the euglobulin fraction, called necrosin. Hyperthermia was not induced by injection of other protein fractions derived from ascitic fluid or normal blood serum or by injection of other fractions of exudates. At present the mechanism by which necrosin produces the febrile response is not known.

HANSEN, Minneapolis.

ACTINOTHERAPY IN CHILDREN. EVA MORTON, Brit. J. Child. Dis. **40**:68 (July-Sept.) 1943.

The types of apparatus used were the centrosol lamp for collective irradiation, the duotherapy units and the Kromayer lamp. A course consisted of three months' treatment with two sessions weekly.

Rickets and debility were the commonest reasons for referring infants and young children to the actinotherapy department. Others were malnutrition, adenitis, alopecia, psoriasis and other cutaneous diseases. Regular attendance for not less than twenty treatments was almost indispensable for cure of most of these conditions.

LANGMANN, New York.

CHANGING VIEWS ON DIGITALIS. EDITORIAL, Edinburgh M. J. **50**:687 (Nov.) 1943.

The name of the author of this editorial is not mentioned. The writer briefly reviews the historical contributions to the subject beginning with that of Withering in 1785 and devotes a few lines to each of the many contributors in sequence since the time of Withering. With regard to digitalis therapy for children, he quotes Sutherland, who reported in 1919 that digitalis specifically slows the rapid hearts of rheumatic children if the rhythm is normal; it does not act as a cardiac tonic but merely serves as a check to an increased rate.

NEFF, Kansas City, Mo.

Society Transactions

AMERICAN PEDIATRIC SOCIETY

JAMES L. GAMBLE, M.D., *President*

HUGH MCCULLOCH, M.D., *Secretary*

Fifty-Fifth Annual Meeting, Atlantic City, N. J., Sept. 26-27, 1944

First Session

Tuesday Afternoon, Sept. 26

President's Address. DR. JAMES L. GAMBLE, Boston.

This paper will be published in full in a later issue of the AMERICAN JOURNAL OF DISEASES OF CHILDREN.

Intestinal Alkalosis. DR. DANIEL C. DARROW, New Haven, Conn.

A report is made of a new syndrome. The patient showed intractable watery diarrhea from birth to the time of this report (age 2 years and 7 months). The stools were acid and contained considerable amounts of sodium, chloride and, at times, potassium. The alkaline urine contained no chloride, little sodium and varying amounts of potassium. The stool chloride was always greater in amount than the stool sodium, and the stool water was greater than the urine water. The absorption of nitrogen, fat, carbohydrate, phosphorus and calcium was essentially normal. As a result of the disturbances mentioned, the boy grew slowly and was subject to frequent exacerbations of the diarrhea accompanied by signs and symptoms of dehydration. The blood serum showed extreme alkalosis, the maximal values being: p_H 7.73; bicarbonate, 47 millimols per liter; chloride, 45 millimols per liter; sodium, 118 millimols per liter. Occasionally, the serum potassium was low (1.5 millimols per liter), but usually it was normal. Usually no signs of tetany were present, but tetanic convulsions occurred once and carpopedal spasm occasionally.

Metabolic data are presented which show that, as chloride is lost more rapidly than sodium, extracellular sodium is transferred into intracellular fluids and approximately equivalent amounts of potassium are released from the cells and excreted. Similarly, when dehydration is treated with sodium chloride and potassium chloride, insufficient sodium is retained to account for the expansion of extracellular chloride, but retention of potassium accounts for the release of sufficient sodium from cells to explain the changes in extracellular electrolytes.

DISCUSSION

DR. IRVINE MCQUARRIE, Minneapolis: The 2 cases reported independently by Drs. Gamble and Darrow undoubtedly represent a heretofore undescribed clinical entity appropriately referred to as intestinal alkalosis. Now that the existence of such an entity has been demonstrated, similar cases will probably be discovered more frequently than when they were not being looked for. It would be most interesting to know the nature of the mechanism involved in the excessive loss of chloride in the diarrheal stools in these unusual cases. Since Dr. Gamble has ruled out the presence of aberrant gastric mucosa in the colon as a cause, the pe disturbance described suggests an analogy with c renal abnormalities in which impairment of functi due entirely to failure of tubular reabsorption.

The Nature of Some Diseases Ascribed to orders of Lipid Metabolism. DR. SIDNEY F Boston.

The important contributions of Rowland, Pick others led to what appeared to be a rational class tion of diseases of lipid metabolism. These inc Gaucher's disease, Niemann-Pick disease and H Schüller-Christian disease, which were thought t differentiated by disturbances of kerasin, sphingom and cholesterol metabolism respectively.

Experience with these conditions accumulated i cent years necessitates a reconsideration of their n and interrelationships and of the nomenclature empl The error in lipid metabolism in Gaucher's disea related closely to that in Niemann-Pick disease (Th hauser). Recent chemical and pathologic studies further proof that these two diseases are disorder lipid metabolism and are probably of intracel origin. There is no evidence to support the conce of "storage" disease. Eponyms are preferable to nomers such as xanthomatosis and reticuloendothel Niemann-Pick disease, for example, is far more a disturbance of the reticuloendothelial system: M different organs and types of cells may be invo The original observation as to a predilection o part of diseases of lipid metabolism for the Jewish is not supported by recent experience. The perio survival in Niemann-Pick disease may be much gr than the twenty-seven month maximum reported i literature: I have studied tissue from 2 patients Niemann-Pick disease, and these patients are still a 1 at the age of 6 years and the other at 10 years.

Hand-Schüller-Christian disease, originally consid a disturbance of cholesterol metabolism character by the triad of bone and eye involvement and dia insipidus, is now regarded as a slowly progres chronic form of a disease the pathologic result of w may be either fibrosis or accumulation of masse cholesterol-laden phagocytes in many parts of the b The early lesions are granulomatous and bear resemblance to the end stage, which was respon for the term "xanthoma." The recent suggestio Wallgren that Letterer-Siwe disease is only a severe and acute form of Hand-Schüller-Christian ease receives further support. Experience has stre ened my suggestion that the solitary or multiple structive lesion of bone called by Jaffe and Lichten eosinophilic granuloma of bone is but a variation o basic process of which Hand-Schüller-Christian Letterer-Siwe disease are other examples. Studie all three conditions lead to the following conclusi 1. These are all variations of the same disease, the clinical picture dependent on the sites involved the rapidity of the course. 2. Lipid, when prese liberated as a part of the local destructive inflam tory process. 3. There is no evidence that these eases represent errors of lipid metabolism. Ther no justification, therefore, for classifying these dis

Gaucher's disease and Niemann-Pick disease. 4. isfactory working classification of these conditions l include the three separate clinical types of Hand- ler-Christian disease, Letterer-Siwe disease and ophilic granuloma of bone, with transitional forms en eosinophilic granuloma and each of the other diseases in this group. 5. These conditions are bly of infectious origin. When the exact cause is vered, the cumbersome nomenclature now employed l be dropped.

DISCUSSION

ALFRED HAND, Philadelphia: I wish to give my hanks to Dr. Farber for taking up this study of metabolism and for the valuable points he has I hope that he will continue his research until s made the whole problem of lipid granulomatosis tly clear, for I think it is the most important field vestigation not only in pediatrics but in internal ine. I may be biased in my judgment because of ecial interest in it, which started during my intern- he first year after my graduation. I then showed knew less than nothing about lipid granulomatosis roneously describing it in my first case as tuber- s with polyuria. Now I know a few facts about it, ey point to many unanswered questions.

m glad to be able to show you a slide from the of the patient in that case. Neither the able nstrator of pathology, Dr. W. S. Carter, who d me at the autopsy and who made the histologic s, nor the professor of pathology, Dr. George ve Guiteras, could explain the lesions. You may to take my word that that is liver, so great is the eration of the parenchyma with infiltration of round cells, histiocytic foam cells and some multi- ted giant cells.

e next slide is from the patient in my second case, I reported to the society twenty-four years ago; ps the ten active members of the society who were t then will recall the photographic print of the genogram, but I am sure they as well as some of you will be interested in comparing this slide the next one, which shows the patient ten years and noting the restoration of normal bone in the areas that were completely devoid of it. It was st marvelous and unexplained recovery. In the of 1943 that young man was a patient in the hospital at Camp Van Doren, Miss.

e final slide is from a lipid granuloma which d in the right lower eyelid of my third patient, I have been studying now for three years in the en's ward of the Methodist Hospital through the ess of my colleagues, Dr. John Diven, the pedia- n of the hospital, and his assistant, Dr. Muldawer. he first seventeen months after his admission to the tal the patient showed no improvement, his weight ining stationary at about 20 pounds (10 Kg.). Then n in weight set in, which has continued for these ears, so that he now weighs 43 pounds (19.5 Kg.) ½ years of age. Pitressin tannate in oil keeps thirst and polyuria for several days at a time, e is now attending school, showing bright mentality.

ARILD E. HANSEN, Galveston, Texas: May I Dr. Farber whether the deposition of cholesterol s in the tissues in the so-called generalized type lso in the eosinophilic granuloma type was different or similar to that in Hand-Schüller-Christian se?

so happens that at the University of Minnesota I 2 patients recently with the generalized type, and in these children I found that very late in the disease there was a disappearance of cholesterol esters from the blood stream. The value for this dropped to 36 mg. in 1 of them and to 2 mg., or almost a negligible amount, in the other.

Analysis of the tissues in these children has not been completed as yet, but preliminary studies of the affected bone marrow show an increase in the cholesterol ester fatty acids to about 4,000 times the level found in normal bone marrow.

DR. BENJAMIN KRAMER, Brooklyn: I wonder whether the patients with Niemann-Pick disease that Dr. Farber referred to showed any evidence of mental retardation or any abnormalities in the retina.

DR. SIDNEY FARBER, Boston: Both are slightly retarded.

Clinical and Blood Lipid Studies in a Child with Chylous Ascites. DR. ARILD E. HANSEN and HILDA F. WIESE, PH.D. (by invitation), Galveston, Texas.

An unusual opportunity to study the clinical and metabolic effect in a human subject of prolonged use of a diet extremely low in fat was afforded when a 3 week old boy was found to have chylous ascites. After removal of the creamy fluid, which relieved the respiratory distress of the patient, he was placed on a regimen which was believed to be nutritionally adequate except for fat. The total consumption of fat for the first year or so was calculated to be in the neighborhood of 1 Gm. daily. In addition to periodic clinical observations, determinations of the lipids of the serum, the ascitic fluid and the mother's milk were made.

As regards the clinical observations, the following points were noted: 1. Gain in weight appeared to be fairly satisfactory during the first year, but periodic removal of ascitic fluid made difficult the interpretation of gain in weight. On the other hand, increase in height was satisfactory. 2. No abnormality was observed as regards the routine examinations of the blood and the urine other than a tendency of the hemoglobin to be slightly low. 3. For the first few months the number of stools was greater than normal, and there were several attacks of diarrhea. 4. The child experienced severe reactions to infections of the upper respiratory tract, five such episodes having been observed. 5. The most marked clinical effects were referable to the skin. Impetigo was very resistant to treatment. Prickly heat was extensive during the hot weather, and the eruption persisted months after the onset of cool weather and long after the skin of other children so affected had cleared. Also, when he was about 6 months of age eczematous patches developed on the cheek, the scalp and various other parts of the body. These lesions responded readily to treatment. 6. When he was examined at the age of 15 months, his appearance was not that of a healthy, robust child. Although the abdomen was large, he was active and was able to walk with assistance.

Determination of the serum lipids, including the fatty acids, such as glyceride, phospholipid and cholesterol ester, revealed an abnormally low degree of unsaturation in all fractions. This result suggested that the infant was unable to synthesize highly unsaturated fatty acids. Administration on two occasions of a cream meal with a study of the serum lipids four and five hours later revealed no evidence of absorption of fat directly into the blood stream. That all dietary fat was absorbed from the intestine into the lymph channels was further evidenced by the fact that the average

molecular weight and the average iodine number of the fatty acids in the mother's milk (266 and 54.6 respectively) and in the ascitic fluid (264 and 56.7 respectively), determined when the child was 3 weeks old, were practically identical. Both the vitamin A and the carotene existed in higher concentration in the ascitic fluid than in the serum.

I hope to obtain consent of the parents to an operation effecting communication of the internal saphenous vein to the peritoneal cavity.

The Biosynthesis of B Vitamins in Man. Dr. L. Emmett Holt Jr. and Dr. Victor A. Najjar (by invitation), Baltimore.

The bacterial synthesis of B vitamins has been demonstrated in fowls, in the rumen of ruminant animals and, under certain conditions, in the cecum of the rat, but no information has been available as to its occurrence in human beings. We encountered this phenomenon in the course of some experiments designed to elucidate the requirements of human beings for various B factors. Experimental subjects were fed a synthetic diet in which the B factors were supplied as pure substances in accurately measured quantities. A gradual reduction of the intake of thiamine led to symptoms of thiamine deficiency in some subjects but not in others. Failure to show symptoms could be correlated with the presence of considerable quantities of free thiamine in the stools. In some subjects the excretion of thiamine by this route was consistently higher than the intake. That this stool thiamine was produced by intestinal bacteria was shown by the fact that it could be made to disappear by administration of succinylsulfathiazole. The intestinal synthesis of thiamine afforded only partial protection against thiamine deficiency, for with a minimum intake of thiamine it eventually failed and in all but 1 of 9 subjects deficiency symptoms developed. This result suggests that some thiamine is required for the nutrition of the bacteria that produce thiamine.

In a second series of experiments the intake of riboflavin was reduced to between 70 and 90 micrograms per day. With this intake the daily output of riboflavin in the stools was sustained for six weeks at a level from four to ten times the intake. The administration of succinylsulfathiazole for an additional five weeks caused no appreciable decrease in the excretion of riboflavin, a result which indicates that this factor can be produced by bacteria which are resistant to the drug. No symptoms of riboflavin deficiency were observed during the experimental period.

The observation that intestinal bacteria may synthesize B vitamins carries implications important for human nutrition. It indicates that under certain conditions at least the commonly accepted requirements for these factors are far too high and that a factor of safety exists which has not hitherto been appreciated. The conditions which influence this biosynthesis remain to be accurately defined.

Comparison of the Effect of Vitamin D and Citrates on Mineral Metabolism in Late Rickets. Dr. Laslo Kajdi, Baltimore.

Two brothers, 8 and 6 years old respectively, with rickets were studied. Both have received the usual amounts of vitamin D but have had little exposure to sunshine. The rachitic deformities were mainly restricted to the lower extremities. Physical examination showed no other abnormalities. Roentgen examination indicated active rickets. With respect to the chemistry of the blood, a low level of serum phosphorus (3.2 and 2.6 mg. per hundred cubic centimeters of blood) a increased phosphatase activity were the only abnor findings. The nonprotein nitrogen and the car dioxide-combining power were normal. The test tolerance of dextrose and the test for renal funct gave normal results. Examination of the urine g normal results. No excessive excretion of organic a was found. On administration of ammonium chlor the patients were able to excrete acid urine.

On studies of the calcium and phosphorus bala made before treatment was begun, it was found t both with low and with normal intake of calcium a phosphorus the patients had a negative balance of c cium and to a less degree of phosphorus. The excret of urinary calcium was extremely low; the urinary-fe phosphorus partition was also low, though to a l degree this abnormal partition was independent of inta Therapy both by means of citrates and by administrati of vitamin D significantly improved the mineral balan The level of urinary calcium increased. The levels fecal calcium and phosphorus diminished, a fact wh indicates better absorption. While the vitamin D d not affect significantly the level of phosphates in urine, the citrate increased it to about 25 per cent abo the level during the control period. One hundred cu centimeters of molar citrate solution produced resu comparable to those given by 10,000 U. S. P. units vitamin D.

In spite of these favorable changes in metaboli roentgen examination did not indicate healing un either regimen during a period of two months. The fore both children were given large doses of vitamin —50,000 and 200,000 U. S. P. units respectively—resu ing in further improvement in the mineral metaboli and roentgenographic evidence of healing in two mon and three weeks respectively. The serum phospho and the phosphatase activity were little affected by vitamin D, even in these massive doses, while admin tration of citrates actually decreased both the ser calcium and the serum phosphorus. Studies of urinary clearance of mannitol and phosphorus indica normal glomerular filtration and high phosphate cle ances. Both therapeutic measures decreased the ph phate clearances and thus moderately improved tubular reabsorption of phosphate.

After corrective osteotomy while in cast a high le of serum calcium and abnormally high excretion urinary calcium were observed, in spite of the vitam intake's having been reduced by one third. Administ tion of the vitamin was discontinued for twelve da Thereafter 60,000 U. S. P. units kept the patients satisfactory condition. After removal of the cast and resumption of normal activities a less favorable balan was obtained. The level of serum phosphorus dimi ished; nevertheless, roentgenograms indicated furth healing.

The healing of vitamin D–resistant rickets witho significant rise in the level of serum phosphorus h been observed by previous investigators also.

DISCUSSION

Dr. Allan M. Butler, Boston: I think it might desirable to supplement Dr. Kajdi's findings about effect of operation on patients with late resistant rick by such findings as Dr. Green and I have had in treatment of a series of patients, because one should aware of what may happen when one operates on su a child.

We have had 3 children who had osteotomies a who had persistent rickets for years; the rickets h been only partially controlled by the giving of hundre

of thousands of U. S. P. units of vitamin D a day. The first child was brought in for operation, and her usual dose of 100,000 U. S. P. units of vitamin D was given up to the day of operation. Shortly after operation, it was noted that the child had hematuria. Examination of the urine showed calcium phosphate casts. The serum calcium and the inorganic phosphates were elevated above normal. The level of the serum phosphatase had fallen. Thus the child's blood chemistry had undergone such a change as would not only lead to complete healing of the rickets but also to an increase in the product, serum calcium times serum phosphorus, that resulted in serious hematuria.

Roentgenograms taken at that time showed that the rickets, which we for years had been unable to heal completely by administering large doses of vitamin D, was well healed.

When we operated on the other 2 children, we discontinued the administration of vitamin D for, I think, approximately a week before the operation. These 2 children had the same abnormal rise in serum calcium, with elevation of the serum inorganic phosphorus to a normal level and dropping of phosphatase to normal. Roentgenograms also showed complete healing of the rickets.

Therefore, we have these cases to add to those which Dr. Kajdi has just reported. Our experience makes us very careful of the urine volume of such children after operation.

We have also had some other complications. I see that Dr. William Green is here. I don't know whether he would like to call attention to the other complications or whether he thinks the observations are too inadequate to warrant mentioning.

Dr. William T. Green (by invitation), Boston: In March 1943 a child 5 years old was admitted with a severe type of active resistant rickets with marked deformities. It was decided to correct the deformities of the femurs and tibias during the active phase, since the bones, which showed marked decalcification, could be more readily fractured at this time; and we knew we could rapidly produce healing after correcting the deformities by the proper dosage of vitamin D. Under anesthesia the tibias were readily fractured manually and the femurs by an osteoclast. The corrected positions were maintained by a combination of traction and plaster splints.

The immediate postoperative course was uneventful, but on the eighth postoperative day this child, without preliminary warning, had a single, severe, prolonged convulsion which terminated coincidentally with the intravenous administration of calcium chloride. However, the patient did not have tetany; a calcium determination was performed on blood drawn during the convulsion. This child was unconscious for many days, and her mental recovery was extremely slow, although her reactions now are essentially normal.

We were forced to conclude by the process of elimination that fat embolism was the most likely explanation of this episode, although we were unable to prove its existence. Since fat embolism in children must be rare (we had never before recognized it as occurring and are not familiar with reports of its occurrence in persons of this age), the question arose as to whether the physical characteristics of bone during active rickets are such that they are conducive to fat embolism if surgical operations are performed during this phase. However, since that time we have had a similar experience with another child following osteotomy, and this child did not have rickets.

Dr. Paul György, Philadelphia: Biosynthesis of vitamins by the bacterial flora in the intestine might be of great importance with respect to the peculiar and spectacular difference between the intestinal flora of breast-fed and that of bottle-fed infants. The question arises whether the specific bifidus flora in breast-fed children is particularly suited to the human infant as a source of essential nutritional factors.

The second problem is the possibility of biosynthesis, not of vitamins alone but also of antibiotics, by the intestinal flora and specifically by Lactobacillus bifidus in breast-fed infants. During the past year I found, in collaboration with Dr. Worley at the Babies and Childrens Hospital, in Cleveland, some evidence that antibiotics are produced in infants and are excreted in the urine. The results were, however, erratic, and the study has to be expanded before the findings can be considered valid.

As a working hypothesis, one could perhaps assume that the natural immunity of the breast-fed infant is based, at least, in part, on biosynthesis of antibiotics by the intestinal flora.

Dr. Laslo Kajdi, Baltimore: I wish to say that it is known that if a person is immobilized the serum calcium will rise. Therefore, in an effort to be cautious I followed at weekly intervals the levels of serum calcium and serum phosphorus, and the children clinically did not appear sick at the time of this high level of serum calcium. Although the blood chemistry showed this retrogression after the casts were removed, the roentgenograms which were taken showed continued healing of the rickets. I received a report from the mother about a year later, after the children went home, stating that they were doing very well.

Chemotherapy of Staphylococcus Aureus Infection of the Lung and Pleura in Infancy.

Dr. Benjamin Kramer and Dr. Benjamin Philips (by invitation), Brooklyn.

Until recently the prognosis in severe suppurative disease of the lung and the pleural cavity in infancy due to Staphylococcus aureus has been grave. Kanof, Kramer and Carnes in 1939 (*J. Pediat.* **14**:712 [June] 1939) reported a mortality of 70 per cent in a series of 16 infants less than 1 year of age. In 1942, Clemens and Weems (*J. Pediat.* **20**:281 [March] 1942) reported on a series of 6 infants below the age of 2 years; all of these died despite chemotherapy. In summarizing the experience of Babies' Hospital from 1922 to 1943, Riley (*J. Pediat.* **24**:577 [May] 1944) reported a gross mortality of 34.5 per cent in 29 children up to 13 years and 55 per cent in 9 infants under 3 months of age. The greater severity of this illness in young infants was also noted by Hochberg and Kramer (*Am. J. Dis. Child.* **57**:1310 [June] 1939) and by Ladd and Swan (*New England J. Med.* **229**:1 [July 1] 1943). The latter observers reported a mortality of 66.7 per cent in 12 patients below the age of 4 months and 4.8 per cent in a series of 21 patients older than 4 months.

During the past year we have treated 5 infants less than 3 months of age who had suppurative disease of the lung and the pleural cavity due to Staphylococcus aureus; there were 4 recoveries and 1 fatality. The 1 fatality occurred in a moribund child, who died within eighteen hours after his admission to the hospital. This marked improvement in therapeutic results is attributable, we believe, to the use of penicillin. The following brief case histories give graphic proof of its great value. Incidental observations are reported concerning the course of the pulmonary and pleural lesions, the

indications for operation in empyema, the optimal dosage of the drug and possible reasons for the failure of therapy in the 1 fatal case. Although other children with infection due to Staph. aureus have been treated, this report is confined to very young infants because of the crucial nature of such a therapeutic test in this age group.

The 5 children in our series ranged in age from 4 to 12 weeks. All were critically ill on their admission to the hospital; they had extreme respiratory difficulty and cyanosis and showed clinical evidence of extensive pulmonary consolidation. Each of the 5 children received one of the sulfonamide compounds before his admission in a dose usually adequate for bronchopneumonia. In 4 instances this was ineffective. In 1 instance (patient II) the child appeared improved, but the empyema reappeared three days after the administration of sulfadiazine was discontinued. Penicillin therapy was instituted in each case only after the presence of Staph. aureus had been demonstrated by pleural aspiration. Of the 4 patients who recovered 2 received penicillin intrapleurally only (II and III) and 2 both intramuscularly and intrapleurally (I and IV). The total amount of penicillin administered to the patients who recovered was 70,000, 100,000, 450,000 and 640,000 Oxford units respectively, given over a period of seven to twenty-eight days. Thoracotomy and rib resection were necessary in 2 patients (III and IV)—in 1 (III) apparently because the empyema was loculated and penicillin had been repeatedly injected into one of the pockets, which was rendered sterile while the others were still positive. Supportive therapy, including administration of oxygen, parenteral administration of fluids and transfusions of blood, was given each child as indicated.

Only one difference is found when the course of treatment in our series is compared with that in previously reported series in an effort to explain our better therapeutic results. Obviously the additional agent was penicillin.

Final Session

Wednesday Morning, Sept. 27

The Crying of Newly Born Infants: The Community Phase. Dr. C. Anderson Aldrich, Dr. Chieh Sung (by invitation), Dr. Catharine Knop (by invitation), Geraldine Stevens, R.N. (by invitation), and Margaret Burchell, B.Sc. (by invitation), Rochester, Minn.

This is the first of a series of reports on the crying of newly born babies. It comprises the results of thirty days' continuous observation of the amount of crying done by the infants in the nursery for the newborn at St. Mary's Hospital, Rochester, Minn. The data are analyzed in this report from the standpoint of the crying of the community of infants as distinguished from that of the individual babies.

Charts of the amount of crying as well as the amount of nursing care were made for each hour of every day. These were arranged so as to provide a diagram of the diurnal crying for the average baby per average day.

A reciprocal relationship between nursing care and amount of crying was clearly shown. It was also demonstrated that floor and nursing routines were reflected in the wailing of the babies. During this period the average baby cried nearly two hours daily.

It was possible to study statistically the number of babies crying at any one of seven hundred and twenty instants. It was found that only 0.14 per cent of the time did as many as 50 per cent of the babies cry once, while on the average about 10 per cent of the were vocalizing at any given instant. This makes seem unlikely that crying in the nursery is large contagious.

A slight but possibly significant correlation betwe crying and the barometric pressure was found.

Since crying in the neonatal period is a reflex, d fensive mechanism, it would seem that a nursery ro tine which reduces the need for it should be the go From this preliminary survey it must be assumed th it will be necessary to increase nursery care in o present setup in order to improve the situation. addition, the discrepancies which always crop up b tween nursery care and floor routines must be iron out.

This report will be followed by a study, based o the same data, in which the crying of individual babi is considered.

DISCUSSION

Dr. Charles Hendee Smith, New York: If the is one factor which Dr. Aldrich has not mentioned, is the body warmth of these infants. I do not kno how warm the babies are kept in his nursery, but one walks past the nursery in any hospital, at lea in my experience, one sees two thirds of the babi lying practically naked, wearing only a shirt and diaper. They have kicked off the bedclothes and a lying with bare arms and legs. When they go hom they are warmly wrapped up, because when the mothe isn't bright enough to do it the grandmother is. Sh knows that a baby needs to be kept warm.

I wonder if that is not one of the factors whic account for less crying at home than in the hospita I have always felt that it was an outrageous thin for a mother to go into a private room in a hospita and pay up to $36 or $50 a day for it and have th baby put into a nursery where he is allowed to li uncovered a great part of the time; it would neve happen in a home. It is taking money under fals pretenses, in my opinion, for a hospital to pretend t give adequate care to an infant and still expose hi to chilling.

The temperature of the nursery is warm, no doub but if it is warm enough to keep the infant comfortabl it is warm enough to make him sweat when he i covered, which isn't good for him. If it is not tha warm, he will be chilled when he is uncovered. A per son who goes to sleep without any bedding even in warm weather usually soon reaches for a sheet or a blanke to cover himself with. Moreover, warm nurseries mak nurses perspire and tend to take cold when they go t a cooler room.

Some years ago in Montreal, Canada, I presented simple device which I have used for nearly forty years a little bag for babies. We used it in Bellevue for great many years and it has been copied in many hos pitals. I have used it for my private patients almos from the beginning. It consists merely of a ligh blanket folded over and sewed up across the shoulders You might compare it to a split pillow case. The baby is put in it except for his head, and a couple of safety pins are put in the front so that he can't kick off hi bedclothes. The mothers who use it are enthusiastic It seems to be something that could be used to advan tage in more hospitals and nurseries than is the cas at present.

Dr. C. Anderson Aldrich, Rochester, Minn.: have nothing to say in regard to Dr. Smith's remarks

cept that we have an air-conditioned nursery in hich the temperature is kept above 80 F. at all times. e did not attempt in this paper to go into the indidual causes of crying, which will appear in a later port. I can say, however, that preconceived ideas out babies' crying mostly because they are hungry e inaccurate, because we are having a difficult time owing a significant correlation between the amount crying and the amount of food that the babies get.

lf Feeding in Infancy. Dr. Charles Hendee Smith, New York.

Most infants are well into the second year before ey are considered by their mothers and by many udents of child behavior to be capable of learning a actical technic of self feeding (Gesell says that self lp is characteristic of the second year, beginning at to 18 months. Bakwin says that at 12 to 14 months infant may be taught to manage a spoon. Clara avis says that a child may try to use a spoon at 6 onths but may not be successful till 12 months or der. Bartlett says that a baby is usually fed most his food to 2 or 2½ years.) No small number of ildren are still fed by the mothers until 4, 5 or even years. The result is usually anorexia with all its tendant behavior problems. In the past five years a ccessful method of education in self feeding during e first year has been used with a large number of bies in private practice and in hospitals.

The first step is to make the baby hold his own ttle as soon as he is able to use his hands for volunry grasping, at about 4½ months. A baby who holds s own bottle can easily be taught to hold his cup and take orange juice from it at 4 to 5 months and milk 7 to 8 months.

As soon as feeding of solid foods is begun—at 4½ to months—the baby is taught to help with spoon feedg. (There is no special advantage in starting the eding of solids earlier, and it is possible that too rly feeding of solids underlies the antagonism to them own by some babies.)

The technic of teaching spoon feeding is simple, but e mother must be shown exactly how to do it. She sits the baby's right, facing in the same direction with er left arm behind him and supporting his back and er left hand holding his left arm and hand and keepg his hand out of the bowl of food. The baby's right and is placed on the mother's little finger and if need e held there by her third finger. The spoon is held y her thumb and her index and middle fingers. Food scooped into the spoon, which is then conveyed to e baby's mouth. After a few attempts, usually at e first lesson, he will pull on her finger toward his outh. In a few days or weeks he will refuse food iven in any other way, helping with every mouthful.

At 6 to 7 months the spoon is placed in the baby's and and merely guided by the mother. He soon arns the scooping motion necessary to fill it. The oon should be a teaspoon of standard size, bent so at his grasp of the curved end will keep the bowl orizontal as it approaches his mouth. The usual baby oon is too small. A bib large enough to extend to e tray or table under the bowl saves the floor and e clothing so long as there is spilling. The mother ay stand by with a "pick-up spoon" to take care of e food spilled.

By 8 months the baby can be taught to feed himself ith some spilling and with very little help, mainly in craping the dish. He will become adept long before 2 months. *Once started, this plan should never be abandoned; that is, no food should be given without having the infant share in the feeding.*

This method of training makes it possible for the baby to feed himself many months before he would do so merely by observing the use of cup and spoon in the hands of others. Infants learn better by doing than by watching. If the mother makes an intelligent and patient effort there will be no failure. It is worth while to accelerate the baby's development in this mechanism because by this means he is removed at the earliest possible time from a state of parasitic dependency on his mother. Babies who have learned to feed themselves early rarely have behavior anorexia. Babies fed through the second year or later often have bad appetites. Although it takes a little more trouble to train the babies at first, it saves the mothers much time and anxiety later.

It may be concluded that babies should be able to feed themselves by 8 or 9 months and should not be fed by the mother into the second year.

DISCUSSION

Dr. C. Anderson Aldrich, Rochester, Minn.: I don't want to make this appear to be a duet this morning, but I think there is one aspect of Dr. Smith's remarks which is important to bring out, and which he just touched on. That is the fact that in conducting this education in self feeding of little babies, one is teaching them responsibility for their own existence, and it seems to me that that is one of the most important objects in rearing children—fostering a sense of responsibility for their own acts in such basic matters as eating, sleeping and eliminating. If one can get a baby from the beginning to take the responsibility for his own eating mechanisms, he is likely to take responsibility in other activities later.

Dr. Hugh McCulloch, St. Louis: I think this is a duet of papers, decidedly. Their one strong note in common is that they are dealing with primitive, instinctive, essential activities of early life. One note that runs through both papers is the fact that most of our babies are burdened with artificial devices made by adults to control their activities. If they were left to their own activities they would behave much better.

Clinical Significance of Infants' Head Size. Dr. Julian D. Boyd, Iowa City, Iowa.

This article will appear in full, with discussion, in a later issue of the American Journal of Diseases of Children.

The Effects of Marked Rickets in Early Childhood on Skeletal Development in Adolescence. Dr. Ethel C. Dunham, Washington, D. C., and Dr. Herbert Thoms, (by invitation), New Haven, Conn. (From the Children's Bureau, United States Department of Labor, Washington, D. C., and the Department of Obstetrics and Gynecology, Yale University School of Medicine, New Haven, Conn.)

This report gives the case histories of 10 children who in early childhood had marked rickets, diagnosed from roentgenograms of the wrists. These children vere included in the New Haven Rickets Study conducted by the Children's Bureau, United States Department of Labor, in the period 1923 to 1926 (Eliot, Martha M.: The Control of Rickets, *J. A. M. A.* **85**:656-661 [Aug. 29] 1925).

The children were reexamined in adolescence to determine the effect of the rachitic process on their skeletal development, especially that of the pelvis.

Physical examinations, certain anthropometric measurements, and roentgenograms of the pelves of these 10 children were made when they were between 15 and 19 years old. Pelvic roentgenograms using two standard technics were made and read by three obstetricians. The complete findings will form the basis of a separate report. The pelvic films were read by Dr. Thoms. The findings were as follows:

Nine of the 10 children who had had marked or moderate skeletal deformities still had some type of skeletal deformity in adolescence.

Eight of the 10 children had high sitting-height standing-height ratios, which were considered to be evidence of interference with growth of the extremities as well as of rachitic deformity.

Five of the 10 children were found in adolescence to have rachitic pelves; 5 had normal pelves. It was found that the older the child at the time that active rickets of moderate or marked degree was indicated by roentgenograms of the wrist, the greater was the incidence of rachitic pelvis in adolescence.

It was found also that in this small number of children knock knees were associated more often with rachitic pelves than were bow legs.

The Use of 5 per Cent Sulfathiazole Ointment in an Emulsion Base for the Prevention and Treatment of Pyoderma in Newborn Infants. DR. CHARLES A. WEYMULLER, Brooklyn.

At Long Island College Hospital 3,205 infants have so far been anointed just after birth with 15 Gm. of 5 per cent sulfathiazole ointment in a water-soluble base, in an attempt to prevent pustular infections. When the infants became exposed, they were reanointed with this preparation, the exposed nursery was closed and any infant with pyoderma was treated by evacuation of the pustules under 70 per cent alcohol, followed by frequent local application of 5 per cent sulfathiazole water-soluble ointment.

The experience has been excellent from August 1942 to August 1944 in that so far there have been only 4 sporadic cases of pyoderma, without spread to neighboring infants in the same nursery or to adjacent nurseries.

From 1930 to 1940, when pyoderma developed in an infant the child was isolated and treated by various current remedies. The nurseries were closed, and infants who acquired the disease were isolated. Of the 10,534 infants born at Long Island College Hospital during those ten years, 130 infants had pyoderma. The outbreaks were multiple and apparently self limited. There was much variation in severity.

Beginning in 1940 each newborn infant was anointed with 15 Gm. of 2 per cent ammoniated mercury ointment after being cleansed with sterile corn oil. When pyoderma supervened, all infants affected were isolated; the nursery was closed, and exposed infants were reanointed with 15 Gm. of 2 per cent ammoniated mercury ointment. From 1940 to 1942, 3,064 infants were so treated, and 35 had pyoderma. Outbreaks were multiple and varied. Ammoniated mercury ointment seldom limited spread or aided healing; dermatitis venenata was common, and the salve was difficult and disagreeable to handle. Since the introduction of 5 per cent sulfathiazole ointment in an emulsion base the results of treatment have been excellent, and the difficulties referred to are no longer encountered.

Laboratory studies of the 3,205 infants anointed with 5 per cent sulfathiazole ointment revealed the following data: The levels of blood sulfathiazole, the blood counts and the urine were not significantly altered. In 78 instances the level of blood sulfathiazole (Jorgense varied between a trace and 1.6 mg. per hundred cub centimeter—an average of 0.5 mg.

Forty-nine of the 3,205 infants who had had proph lactic inunction of 5 per cent sulfathiazole ointment an emulsion base were readmitted for serious illness which required full doses of a sulfonamide compoun In 43 instances the drug employed was sulfathiazol No instance of sensitization to sulfonamide compoun was encountered.

Admittedly, this short experience is insufficient prove that this agent will always be so effective a that it will produce no disturbance. However, it h vastly improved the prevention and management pustular infections of the newborn in the nurseries Long Island College Hospital for these two years.

While most of these 3,205 infants apparently we protected by the application of sulfathiazole ointme immediately after birth, I do not wish to convey t impression that all pyodermas are due to infectio acquired during the passage through the mother's bir canal. During the period covered by this study babi were discharged from the hospital between the seven and tenth day after birth because of a shortage maternity beds. Had they been kept in the hospit for two weeks, as was the former custom, more sporad infections might possibly have occurred. Furthermor the natural history of pyoderma in infants is chara terized by periods of low incidence, even though special control measures are taken. Several more yea of observation, rather than larger numbers of cases, wi show how well this new agent will hold up as an adjun to good nursery technic.

The Influence of the Administration of Sulfanilamide on Acute Glomerulonephritis in Children. DR. MILTON RAPOPORT (by invitation) an DR. MITCHELL I. RUBIN, Philadelphia.

The effect of the administration of sulfanilamide o the course of acute glomerulonephritis was evaluate in a group of 33 children with this disease. A com parable group of 40 children with acute glomerulo nephritis not treated with sulfanilamide were used a controls. All children in both groups recovered com pletely from their disease, as most children with acut glomerulonephritis do, so that the comparison was con cerned with the influence of sulfanilamide on th severity of the disease at its height and on the lengt of time required for complete healing. Sulfanilamid was administered in presumably adequate doses for fiv to eight weeks after the admission of each patient t the hospital.

The study indicated that the administration of sulf anilamide, despite its known ability to clear foci o infection due to beta hemolytic streptococci had n apparent effect on the renal lesion at its height, a measured by the time required for renal function, hyper tension and cardiac abnormality to return to normal Similarly there was no apparent effect on the lengt of time required for the renal lesion to heal completel a combined normal routine urinalysis, a normal Addi sediment count and a normal sedimentation reactio being used as criteria of recovery. The value of sulf anilamide in controlling the infection antecedent to th nephritis is not negated, but it is felt that once nephriti is initiated in the child, this drug does not influence th "natural" course of the renal lesion.

DISCUSSION

DR. BENJAMIN KRAMER, Brooklyn: I should like t ask Dr. Rapoport what effect the therapy had on th

terial flora of the upper respiratory tract and ther foci of infection were removed as part of the rapy.

DR. MILTON J. RAPOPORT, Philadelphia: I cannot wer the question.

DR. WILLIAM L. BRADFORD, Rochester, N. Y.: I think of the original claims was that sulfanilamide, when inistered during the course of acute glomerulo-hritis, helps to control exacerbations of a focal in-ion in the throat or in the sinuses.

should like to inquire of Dr. Rapoport whether he data concerning the occurrence of such flare-ups of ction in the two groups of patients. I should also to ask about the presence of tonsils in the two ups.

DR. MILTON J. RAPOPORT, Philadelphia: In reply to Bradford's question, the infection preceding the e-up of nephritis was detectable clinically, since the ldren were hospitalized continuously. Administration sulfanilamide was apparently without influence on number of flare-ups.

The difference in ultimate prognosis between our up of children and the patients in the Johns Hopkins dy is impressive. It is widely appreciated that most ldren with acute glomerulonephritis go on to com-te recovery: Our experience over a ten year period been a rate of recovery of almost 98 per cent, com-te recovery usually taking place within six months the time of onset. In the Johns Hopkins group a ge percentage (up to 50 per cent) became chronic hritic patients. Apparently the natural course of ute glomerulonephritis is different in the adult, chronic hritis developing in a large percentage, whereas the ld almost always recovers completely.

DR. HENRY F. HELMHOLZ, Rochester, Minn.: There two points that I should like to raise. The first gards the cause of nephritis. Is it a sensitization? ctically nothing is known about the causation of hritis. I think it is gradually being accepted that umatic fever is related in some way to hemolytic reptococci, and this relationship has been demonstrated obably better than in any other way by the effect of ing sulfanilamide as a prophylactic.

Does this same relationship hold with regard to hritis? I think possibly the best explanation of e causation of nephritis is that it is a sensitization oduced somehow in the renal tissue to a foreign otein, possibly some product of hemolytic streptococci. he fact that there has been no such relationship be-een therapy with sulfonamide compounds and re-rrences, as has been shown by Longcope, is of nificance.

I should like to emphasize, however, the fact that e prevention of the disease rather than its cure is the utstanding principle in the treatment of rheumatic ver, and I think it is of importance to follow up this ork experimentally as a possible means of a further tack on nephritis, for in this field physicians are rtainly starting from scratch.

DR. ALLAN M. BUTLER, Boston: Is it fair to say at the vascular disturbances that occur in children ith nephritis are greater than such manifestations in der patients, and that in older patients there is a gh incidence of the phenomena due to sensitivity? If o, it might be suggested that in older patients there is ore of the sensitivity aspect similar to the sensitivity streptococcic infection in rheumatic fever, whereas younger patients the symptomatology of the disease nd the possibility of permanent damage to the kidneys are more closely related to acute vascular disturbance and less closely to the phenomena of sensitivity.

If all that should be true (and I realize that it may not be), it would account for the difference in the emphasis which the pediatrician as contrasted with the internist places on the magnesium sulfate therapy which specifically lessens the vascular spasm and the resulting disturbances.

DR. MILTON J. RAPOPORT, Philadelphia: I agree entirely with Dr. Butler. In the Johns Hopkins study, the antistreptolysin titer remained elevated for about the same length of time in the control group and in the group treated with sulfanilamide. Why this titer should have persisted at a high level for as long as six months after the patient's discharge from the hospital is not clear: Apparently sulfanilamide therapy had no effect on the antistreptolysin titer.

DR. MITCHELL I. RUBIN, Philadelphia: The one important point of difference between the patients studied by the Baltimore group and our patients is age. The natural course of the disease in the two groups is different, the rate of recovery of the young children being about 95 per cent, whereas that of the adults was closer to 60 per cent. Thus any benefits from therapy with sulfonamide compounds would be less apparent in the younger age group. Nevertheless, there is no evidence even of shortening of the disease process in our group. In both groups cardiac involvement, as demonstrated by the electrocardiogram, was high. I know of 2 young adults in whom death resulted from heart failure.

DR. ALLAN M. BUTLER, Boston: May I ask, how about the manifestations of cerebral injury which might result?

DR. MITCHELL I. RUBIN, Philadelphia: In answer to your question, Dr. Butler, regarding cerebral manifestation in adults, of a group of about 15 young adults 2 had marked cerebral symptoms. Thus it would appear that the nature of the disease in the child and in the adult must be similar, a fact which makes it difficult at this time to assess the factors which vary the prognosis for the two groups.

Summary of a Three Year Study of the Clinical Application of Disinfection of Air by Glycol Vapors. DR. JOSEPH STOKES JR., and DR. T. N. HARRIS (by invitation), Philadelphia.

The clinical application of disinfection of air by glycol vapors has been investigated for three winters at the Children's Seashore House in Atlantic City. These studies involved primarily the determination of the rate of incidence of infections of the respiratory tract in groups of patients whose supply of air was largely disinfected and in control groups.

This institution, a convalescent home, was selected because the prevailing conditions were peculiarly well adapted to the exhibition of the clinical effects of air disinfection.

Propylene and triethylene glycol were used. The degree of disinfection of air was determined by settling plate counts of bacterial colonies; the concentration of glycol vapors was determined by chemical procedures.

It was found that whereas 132 infections of the respiratory tract occurred in eighty-one weeks in the control wards, 13 such infections occurred at the same time in comparable control wards. An epidemic of common colds during one winter showed an even better ratio, of 79 such infections to 3. Counts of bacterial colonies were reduced by propylene glycol vapor from

81 to 13 per Petri plate per hour, and the concentration of propylene glycol vapor in the air was maintained in the neighborhood of 0.069 mg. per liter.

It is concluded that the chemical disinfection of air can be applied to the clinical problem of the control of air-borne cross infection with satisfactory results under similarly favorable conditions.

DR. CULVERT: May I ask a question? Was there much evidence of any toxic effect of these vapors on the persons exposed to them?

DR. T. N. HARRIS, Philadelphia: No, there is no evidence of that at all. We should not rest on our observations made in the course of the experiment itself. Extensive studies have been made on various animals by Dr. Robertson of Chicago, in which he used an order of magnitude much higher than anything to which children could be exposed.

DR. ALLAN M. BUTLER, Boston: Over what periods of time?

DR. T. N. HARRIS: Philadelphia: That study has been running for well over a year, probably over eighteen months.

DR. ALLAN M. BUTLER, Boston: And the animals were continuously exposed to such vapors?

DR. T. N. HARRIS, Philadelphia: Yes, and other animals had it by oral administration. There were pathologic studies in those experiments.

DR. S. GRAHAM ROSS, Montreal: Dr. Harris, is one sensible of the presence of this substance?

DR. T. N. HARRIS, Philadlephia: Well, I am, but most people are not. I can detect a faint sweetish quality in the air after I have been breathing air containing a concentration completely adequate for disinfecting purposes, but I do not think I ever met anyone else who was so sensible of it.

DR. S. GRAHAM ROSS, Montreal: You may be sensitized to it.

DR. T. N. HARRIS, Philadelphia: I do not think so; I could notice the vapor at the very beginning of our experiments.

Attempts to Find Poliomyelitis Virus in Fish. DR. JOHN A. TOOMEY, Cleveland.

Using Kramer's technic, stool contents were prepared from fish, and the virus was looked for.

Though the virus was possibly found once, I did not know where it had come from—the fish or the handlers. Even though it might have come from the fish, it was not felt that this fact was of great epidemiologic significance, because fish are gutted before sale and simple cooking destroys the virus. The handlers of these fish in the epidemic area may well have been carriers.

I then attempted to immunize carp in various ways. Although I allowed the fish to feed on the virus and likewise injected it, I failed absolutely to demonstrate the presence of the virus in the gastrointestinal contents or the presence of neutralizing antibodies in the blood serum of the fish, even though I waited for over a year after immunizing the fish to collect the latter specimens. This result is unusual, for in every other species used neutralizing antibodies can be easily demonstrated.

Metabolic Studies in Hereditary Periodic Paralysis. DR. IRVINE MCQUARRIE and DR. M. R. ZIEGLER (by invitation), Minneapolis.

Eight of 13 siblings in the family reported on are known to suffer from periodic episodes of flaccid paralysis. These children represent the third generation which has exhibited this tendency as a dominant hereditary trait. One of the children, a 17 year old y[ou]th died in a paralytic attack when the respiratory mu[scles] became involved. A second boy, aged 15 years, se[rved] as a subject for the present studies. It was found attacks of paralysis could be induced at will by ad[min]istering 150 Gm. of dextrose by mouth or by inje[ction] 50 units of insulin. In such induced attacks, as as in spontaneous episodes of paralysis, both the tassium and the inorganic phosphorus of the serum reduced to subnormal levels. Potassium chloride g[iven] by mouth in 1 Gm. doses every hour interfered the induction of paralytic attacks by dextrose and sulin, even when hypoglycemic reactions occurred. one experiment sodium phosphate given similarly vented the induction of an attack by administratio[n of] dextrose. However, this salt, unlike potassium chlo[ride] was ineffective in relieving paralytic attacks which already developed.

Institution of a seventy-two hour fast at a time w[hen] the patient was having severe attacks every day o[n an] ordinary mixed diet resulted in a rise of the se[rum] potassium to normal and in freedom from paral[ysis]. No attacks occurred as long as he was maintained a milk diet, but when sufficient carbohydrate was ad[ded] to raise the ratio of dextrose to potassium above they recurred. A high protein, low carbohydrate (protein 170 Gm., carbohydrate 5 Gm. and fat 80 G[m.]) allowed freedom from attacks even when the potass[ium] intake was low (0.5 Gm. daily), while a high fat, carbohydrate diet (fat 260 Gm., carbohydrate 10 [Gm.] and protein 84 Gm.) was unfavorable (potassium [1] to 1 Gm.). The ratio of preformed carbohydrate potassium in the diet which was the threshold attacks varied with the type of diet, being between and 80 with the high protein, low carbohydrate diet milk diet and approximately 10 with the high fat, carbohydrate diet. The ratio decreased as the amo[unt] of preformed carbohydrate was increased.

DISCUSSION

DR. BENJAMIN KRAMER, Brooklyn: I wonder whet[her] Dr. McQuarrie correlated the various effects of chan[ges] in diet and the intensity of the attacks with potassium in the blood. As a rule, I think the atta[cks] come on when the level of potassium is about 10 m[g.] or less per hundred cubic centimeters.

DR. IRVINE MCQUARRIE, Minneapolis: Yes. Ser[um] potassium values were determined at fairly frequ[ent] intervals throughout the entire period of study. attacks of paralysis were associated with reduced valu[es] usually below 12 mg. per hundred cubic centimete[rs]. During periods of freedom from attacks, normal lev[els] were usually found. When the carbohydrate to pot[as]sium ratio of the diet approached the threshold attacks, serum values fluctuated between 12 and 15 m[g.] per hundred cubic centimeters.

DR. BENJAMIN KRAMER, Brooklyn: Well, does matter how the potassium fluctuates in the diet?

DR. IRVINE MCQUARRIE, Minneapolis: Our resu[lts] indicate that wide fluctuations in the potassium conte[nt] of the diet may be made without the occurrence paralytic attacks so long as the carbohydrate potassium ratio falls below certain levels. The l[evels] vary somewhat with the proportions of protein, carb[o]hydrate and fat in the diet.

Pseudodoxia Pediatrica. DR. HARRY BAKWIN, N[ew] York.

The subject of this essay is the persistence pediatrics of theories and practices even though th[eir] falsity is patent or has been demonstrated.

Advances in medicine are made not only by the covery of new principles, information and technics by the discarding of false teachings and practices well. Among the erroneous practices only recently ndoned are cleansing the mouths of infants after ding, use of oil drops in the nose, vigorous removal the vernix caseosa, early operation for empyema and omyelitis and overrigid feeding schedules.

That indiscriminate tonsillectomy is beneficial to dren is a false idea which has persisted for many rs. A survey conducted in New York city ten rs ago by the American Child Health Association wed that over 60 per cent of children 11 years of in some of the public schools had had their tonsils oved. It was found that when the children whose sils had not been removed were reexamined 3 times groups of physicians, only 65 of 1,000 children had had tonsillectomy recommended.

Myringotomy is also practiced too freely on chil-n. It was possible to reduce the incidence of running s at Bellevue Hospital in infants under 2 years to a le more than a third of its previous rate by limiting scopic examinations and by laying down stringent teria for myringotomy. The use of mastoidectomy infants was correspondingly reduced.

There is no reason to believe that the indiscriminate livery of babies in hospitals is beneficial to either thers or babies. The increase in the proportion of liveries in hospitals bears no demonstrable relation either maternal or neonatal mortality or morbidity. e results obtained by the Frontier Nursing Service Kentucky, where over 97 per cent of deliveries are ne in the home by midwives, are striking. The aternal mortality for the first 4,000 deliveries was s than one seventh of that for the white population the United States as a whole.

Hospitals are unsuited for the care of the newborn. eparation of mother and baby at this early age is physiologic and without precedent in the mammalian orld. The rigid rules in the hospital make breast eding difficult. Infections in babies are not infrequent d account for considerable mortality.

Older infants, too, suffer in hospitals because of the olation generally considered necessary in order to mit cross infections. Infants need the stimulation hich comes from contact with other human beings.

The indiscriminate use of vitamin supplements for ildren is without adequate basis. Eating has been dowed with a moralistic aura; it should, instead, be a pleasure. Eating is an integral part of the culture of the home and the family.

Other erroneous practices are the unnecessary treatment of physiologic bowing of the legs, the premature use of orthodontia, the diagnosis and treatment of rickets on insufficient evidence, the use of unnecessarily expensive sugars and the use of vitamin D during the summer months.

A major error in medical education is failure to train students properly for practice in the home. The student is not taught the indications for laboratory aids in the home. He soon learns that he is not able to obtain the tests which he believes are necessary and consequently feels that he is doing slipshod work. This gives him a feeling of inadequacy and interferes with the sense of satisfaction in his work to which he is entitled. A further error in medical education is failure to impress the student with the significance of disease and death to the family group.

DR. CHARLES HENDEE SMITH, New York: I should like to reenforce Dr. Bakwin's statement that too extensive laboratory work is demanded by most students. In the course of my teaching I regularly asked my students what were the essentials that they would demand in making a diagnosis in a simple case of pneumonia or any other febrile disease; I then put what they asked on the board and added up the cost. They wanted about $150 worth of work on every febrile case before they would venture a diagnosis.

Another thing about which I should like to add a word is the too early feeding of solids to young infants. I think that is one of the greatest errors which have crept into modern practice. Many of you who are not practicing may not know it, but the average physician in pediatric private practice begins to feed solids at 6 weeks or less. Babies do just as well if solids are given only at 4½ to 5 months.

Dr. Bakwin's remarks about vitamin D are worthy of reenforcement. I have taken a number of babies of intelligent mothers within the last few years and withheld from them all vitamin D in the form of added cod liver oil, etc. I have made the mother expose the child's face or other parts of his body to the sun in summer and winter, and there has been no evidence of rickets in this group of children. In the climate of middle New Jersey, where there is pretty good sunshine all winter, they get along just about as well as children who have had cod liver oil.

Book Reviews

Fractures and Dislocations for Practitioners. Third edition. By Edwin O. Geckeler, M.D. Price, $4.50. Pp. 361, with 320 illustrations. Baltimore: The Williams & Wilkins Company, 1943.

This book, a third edition, includes two parts, (1) fractures and (2) dislocations, and an index, all within 361 pages. In successive chapters appear discussions of general considerations, including definition and process of bony repair and its failures, roentgen examination, medicolegal aspects of fractures, complications and hospital organization. Then follow in order chapters on emergency treatment, fracture wounds, reduction, immobilization and follow-up treatment. Individual chapters on the various parts of the skeleton complete the first part of the book. The second part describes some dislocations, including those of the temporomandibular joint, spinal and sacroiliac joints and joints of the clavicle, shoulder, elbow, wrist, hand, hip, knee, ankle and foot, in varying degrees of elaboration. The chapter on facial bones and jaws seems weak, and the chapter on the vertebrae leaves the reader with confused ideas as there is too much repetition and reference to isolated cases. Much information is packed into this volume, and the plentiful illustrations are reasonably illuminating. The author cultivates a curt and often too positive style (some of the statements may be doubted) and sometimes leaves much to be desired in the structure of sentences. In medical writing brief expressions may be simultaneously pleasing and informative. Some editing is needed; the pain associated with fractures of the sacrum is described as "moderate"; "linear tenderness" is mentioned, and the term "drunken cases" is used as on page 99. Several methods are referred to as the Jahss method of treatment of fracture of the pelvis, but no description is given. In treatment of fracture of the body of the scapula, the practitioner is told to apply a Velpeau dressing with the shoulder held back. The reviewer believes this to be an impossible act. On page 140 the hanging cast is described as "an extra heavy circular plaster dressing," extending from the axilla to the knuckles; Caldwell repeatedly warned that it should not be "extra heavy." There are other too broad and apparently thoughtless statements, for example "failure to replace the epiphysis (femur at knee, which is not always displaced in one direction as stated) will result in retarded growth of the limb." There are few typographic errors in the text, and the book is well bound and of agreeable size. For the practitioner who knows considerable about fractures this volume may offer a quick reference to assist him in his daily problems; it can hardly be recommended to the medical student as a basic guide.

Body Poise. By Walter Truslow, M.D., F.A.C.S. Price, $4.50. Pp. 312, with 96 illustrations. Baltimore: Williams and Wilkins Company, 1943.

Dr. Truslow, who is a consulting orthopedic surgeon for a number of hospitals in the city of New York, has written this book primarily for those who are interested in posture, or, as it is more recently designated, body mechanics. These would include orthopedic surgeons, pediatricians with an interest in posture and laym interested in physical training and body developme It is written in the style typical of textbooks.

In the first part of the book the author deals wi the anatomy of the human body, especially as it appli to the structures involved in the maintenance of good figure. In turn, a good figure, Dr. Truslow stat is conducive to good general health and improved fun tioning of the various organs of the body. In this pa of the book he also analyzes the gymnastic kinesiolo of the motor mechanism of the human frame. H describes eight fundamental positions from which co rective exercises can be started.

Since feet are important in maintaining good postur a chapter in the second part of the book is devoted the anatomy and kinesiology of the foot. He describ methods for examining and measuring the arches an for recording their height-length index. He also di cusses the treatment of weak feet by both active an passive methods.

Several chapters are devoted to an analysis of faul posture. Dr. Truslow classifies variations in the anter posterior plane of the body, as the gorilla type and t kangaroo type. He also discusses faulty posture du to lateral curvature of the spine. He describes an explains the use of the spinometer, an instrument fo measuring the variations in the spinal curvature. Tw types of exercises are described for the improveme of faulty posture: (1) muscle-developing and (2) postur training exercises.

The last chapters in the volume are concerned wi the kinesiology of various sports. The author's descri tions of sports, and his analysis of the various necessar movements are interesting and detailed. In general, th sports that require bilateral, symmetric movements ar the most beneficial.

There is a good glossary of anatomic terms at th end of the book, and there are ample and descriptiv illustrations.

Young Offenders. By A. M. Carr-Saunders, He mann Mannheim and E. C. Rhodes. Price, $1.7 Pp. 168, with no illustrations. New York: Th Macmillan Company, 1944.

An investigation of juvenile delinquency was carri out in London and six smaller towns by means o studies of nearly 2,000 delinquent and an equal numbe of nondelinquent children. The delinquent childre were boys who were brought into court beginni Oct. 1, 1938. Sixty social and economic factors we considered for each child including such items a attitude of the parents, income of the family, scho record, interests, social activities, working habits an gang affiliations of the boy.

The results indicate that broken homes, abnorma home atmospheres (overlaxity or overstrictness), ove crowding of homes, poor conduct in school and th laxity of parents in allowing adolescent children o at night contribute to delinquency. The author theo rizes concerning the "lower immunity" of some childre to environmental conditions that lead to delinquenc "We never discover that all delinquents have bee subject to one kind of influence or show some distinc tive characteristic."

This is entirely a statistical study. The onset of the war prevented the prosecution of psychologic studies which were planned. As the author concludes this study like all similar ones gives little information on the exact reasons why individual children become delinquent. The report is well written and represents a great deal of work and study.

Textbook of General Surgery. By Warren H. Cole, M.D., and Robert Elman, M.D. Fourth Edition. Price, $10. Pp. 1,170, with 955 illustrations. New York: D. Appleton-Century Company, Inc., 1944.

This book is a well organized presentation of general surgery. Practically all of the illustrations are original and represent material the authors have seen at the University of Illinois and Washington University. Many of the small technical details of surgical procedure that confront an intern or resident are well described. There is a complete chapter on surgical intervention in relation to diabetes with illustrations of the more common diabetic lesions.

The authors mention the tannic acid method first among the ways of treatment of burns. There has been so much criticism of this method that I believe its dangers and limitations should also have been presented. Some of the chapters contain detailed outlines which are of value for rapid review and as a summary of the subject. Included in the book is a chapter on war surgery which briefly presents this broad field.

In conclusion, this is a sound textbook of general surgery which is clearly written in a simple understandable style and which will be of greatest value to the student, intern and resident surgeon. It is a book that the teacher would find easy to use because of the excellent organization of material.

Radiation and Climatic Therapy of Chronic Pulmonary Diseases. By Edgar Mayer, F.A.C.P., F.A.C.C.P. Price, $5.00. Pp. 393, with illustrations. Baltimore: Williams & Wilkins Company, 1944.

The editor, Dr. Mayer, and twenty-two collaborators participated in writing this book. It is divided into five sections, which deal successively with (1) the physics, physiologic action and sources of light; (2) the artificial light therapy of different clinical forms of tuberculosis; (3) the effects of climate, weather, altitude and solar radiation on tuberculosis and other pulmonary diseases; (4) the roentgen treatment of intrathoracic tumors and of tuberculosis of different organs and parts of the body, and (5) the surgical versus the conservative therapy of tuberculosis of bones and joints.

The book presents a thorough and conservative evaluation of the indications, contraindications, limitations, beneficial effects and possible harmful effects of radiation and climatic therapy. This evaluation of climate and radiation as adjuvants to other therapeutic measures represents deductions based on the wide clinical experience of the various authors and on their familiarity with the literature. The book contains more than five hundred references to pertinent literature.

Guiding the Normal Child. By Agatha H. Bowley, Ph.D. Price, $3.00. Pp. 174, without illustrations. New York: Philosophical Library, Inc., 1943.

The author states that "the purpose of this book is to give a brief account of the normal growth and development of children from babyhood to adolescence, to indicate when and how difficulties occur and to show how they can be best handled. The book is written primarily for the student who is training to be a teacher, but it is also suitable for parents."

The author carries out her purpose well considering that the whole subject of growth and development from infancy through adolescence, intellectual as well as emotional, normal and abnormal, is covered in one hundred and forty pages. With only nine pages devoted to adolescence, for example, only a brief, superficial consideration of the subject is possible. Since the author is a teacher and the director of a child guidance clinic (in England), she devotes more time to children of school age than to those of the other age groups. The freudian viewpoint is followed in explaining problems.

There is a good but brief final chapter on children and the war. The book is well written and interesting.

Family Nutrition. By Rachel M. Winlock, M.D.; Emerson R. Sausser, D.D.S.; Joseph Stokes Jr. M.D.; James J. Waygood, M.D.; Anna de Planter Bowes, M.A., and Pauline Beery Mack, Ph.D. Second edition. Price, 50 cents. Pp. 119, with 22 tables. Philadelphia: The Philadelphia Child Health Society, 1943.

The first edition of "Family Nutrition" was published in April 1942 and reviewed in the AMERICAN JOURNAL OF DISEASES OF CHILDREN (**64**:762, 1942). The chief differences in the second edition are the inclusion of a chapter on "Menu Planning and Rationing," additional data in the chapter on the "Measuring of Nutritional Status" and a discussion of the more recently recognized members of the vitamin B complex in the chapter on "The Nutritional Needs of People."

La eosinofilla masiva de origen infeccioso y evolución regresiva, como una nueva entidad clinica. By Teodosio Valledor. Paper. Price, not given. Pp. 52, with 17 illustrations. Habana, Cuba: Molina y Compañia, 1944.

This monograph written in Spanish is a more complete account (6 observations on children and 3 on adults) of a new symptom complex first reported by the author in 1939. The condition consists of fever, catarrh and adenopathy with 30,000 to 70,000 white cells, of which 80 per cent are eosinophils. There is also a granulation of lung tissue, which is shown in illustrative roentgenograms. The bone marrow shows a hyperplasia of eosinophilic forms, as do the lymph nodes. The disease has a tendency to recovery in two years. No good etiologic factor was found.

Allergy in Practice. By Samuel Feinberg, M.D. Price, $8. Pp. 777, with 36 illustrations. Chicago: Year Book Publishing Co., 1944.

Of the 777 pages in this book 392 are devoted to the general principles of allergy and to the exciting agents of allergy, such as pollens, molds, foods and injected substances, and their modes of operation; the rest of the book deals with the diagnosis and treatment of various allergic disorders.

There are not many illustrations. This, however, does not detract from the value of the book. The meat is in the text, and the meat is good. In books on allergy, in which many references must be made to the original work of other men, it often happens that so many references are made that there is little of the author to be found in the book. Dr. Feinberg has avoided this. He has expressed in clear, judicial and

easily read language what he himself has seen and thinks and what the general opinion of allergists is. Discussions of controversial subjects and descriptions of methods the value of which is not proved are printed in small type, and by this means the author has clearly separated the generally accepted from the debatable. He is not extreme in any way; his opinions are sane and his conclusions just. The majority of allergists would agree with them.

The book is practical, and still the author has not neglected the fundamental and often theoretic concepts on which a proper understanding of allergy depends. The sections on allergic responses to drugs and pollens are particularly good, and that on allergy to molds (64 pages) based on the author's well known original work, is the most complete to be found anywhere.

There are minor points here and there throughout the book with which some allergists would disagree, and inasmuch as allergy in childhood is so common and so important, the book would be improved if a special section were devoted to this subject. There is little concerning allergy in childhood in it except a few pages on infantile eczema. This, however, is a minor criticism, and any pediatrician interested in allergy should own the book. It is the most readable book on allergy with which the reviewer is famiiiar. It is not superficial, nor on the other hand is it superscientific. In short, it is a thoroughly sane, adequate, well presented exposition of a difficult subject by an obviously intelligent well balanced man. The reviewer recommends it unreservedly.

Contribución al estudio humoral en las deshidrataciones agudas del lactante. By Eugenio A. Ruiz. Price not given. Pp. 53, with tables. Santiago, Chile: El Chileno, 1943.

This is a thesis issued by the Eugenio Ruiz Memorial Commission of the University of Chile. It includes discussions of the index of refraction, the protein content and the volume and quantity of red cells in the blood of 33 children under 1 year of age with dehydration. Tables of the results are given. The most noteworthy deviation from the normal was the increase in the content of protein in the blood. In 5 instances in which the level of protein was reduced, edema was present.

Finger Prints, Palms and Soles: an Introduction to Dermatoglyphics. By Dr. Harold Cummins and Dr. Charles Midlo. Price, $4.00. Pp. 281, with 144 illustrations. Philadelphia: The Blakiston Company, 1943.

This book is a scholarly and authoritative study in dermatoglyphics. Dr. Cummins is professor of microscopic anatomy, and Dr. Midlo is associate professor in the same department at Tulane University School of Medicine. The first part of the book deals with the history of the study and the details of making and interpreting prints. The last part has to do with the biologic significance of such studies. Of particular interest to pediatricians is the chapter on the diagnosis of twins.

El sueño normal y patologico en el niño. By Bernard Vijnovsky. Price not given. Paper. Pp. 342. Buenos Aires: El Ateneo, 1944.

This book written in Spanish deals with sleep in children. The first part describes the mechanism and physiology of the normal sleep reflex; then pathologi variations. These include all forms of epilepsy, narco lepsy, piknolepsy and such disorders. They are all illu trated by clinical observations taken from the author clinic. There is also an excellent bibliography of 2 artciles. The subject matter is well organized, and t viewpoint taken is interesting.

Enfermedad quistica del pulmón en la infanci By Teodosia Valledor. Paper. Price, not give Pp. 132, with 75 illustrations. Editorial Neptun Cuba: Habana, 1944.

This monograph written in Spanish deals with 1 cases of cystic disease of the lung observed by th author, who is professor of pediatrics at the Universi of Habana, over a period of ten years. He believ that the condition is a congenital malformation due t mesodermic hyperplasia in which the affected zone remain in the fetal stage of development. Th prognosis is unfavorable and in small children grav The only satisfactory treatment is surgical removal o the areas (lobectomy or pneumectomy).

Rorschach's Test. Volume I. By Samuel J. Bec Ph.D. Price, $3.50. Pp. 223, with 20 tables an 10 figures. New York: Grune & Stratton, 1944.

Of the large number of tests which have been devise for and used in attempts to determine characteristics o personality, the Rorschach test is one of the few tha are still used. The subject is shown a series of 10 in blots and asked to state everything that comes to hi mind from looking at them. The test material is de vised to stimulate free association with fixed stimu having no specific meaning.

This volume records in detail the types of response that have been secured by the author during over twent years' experience. He has set up general norms b comparison with which an examiner can recognize un usual or abnormal responses.

The book does not include a description of the in blots themselves; the reader is referred to earlier pub lications for this. The material is prepared for th psychologist who uses the test rather than for the la reader who may be interested in the general informa tion which a test of this sort can give. A great dea of time has evidently been used in preparing the volume and one can assume that it is authoritative.

Hospital Discharge Study: Volume II: Hospitalized Illness in New York City. By Neva R Deardorff, Ph.D., and Marta Fraenkel, M.D. Price $1.00 (all three volumes, $2.00). Pp. 349 with n illustrations. New York: Welfare Council of New York City, 1943.

This second volume is devoted to the medical aspect of discharges from hospitals in New York city. As a statistical study of the records of over 500,000 patient discharged from these hospitals in a single year, it contains much information of value to public health departments, social agencies, health and hospital in surance agencies, hospital administrators and socially minded physicians.

Advances in Internal Medicine, Volume I. Edited by J. Murray Steele, M.D. Price, $4.50. Pp. 29 with 19 illustrations and 8 tables. New York: Interscience Publishers, Inc., 1942.

As stated in the preface this series of volumes i offered to provide, under the sponsorship of an out-

anding editorial board, a summary of those fields in hich progress has occurred recently.

This volume contains summaries of: the use of the iller-Abbot tube in the diagnosis and treatment of sorders of the gastrointestinal tract; the use of insulin d protamine zinc insulin in the treatment of diabetes; e sympathetic control of the peripheral vascular stem; the antibacterial action of the sulfonamide ugs; the choice of the sulfonamide drugs in the treatent of infection; infections of the urinary tract; present ends in the study of epidemic influenza; the pathonesis and treatment of hypertension, and nephrosis and boflavin deficiency. Each summary includes a bibliraphy.

This volume fills a real need, and the continued blication of the series will be a contribution to the brary of every physician.

rinciples and Practices of Inhalational Therapy. By Alvin L. Barach, M.D. Price, $4.00. Pp. 315, with 59 illustrations. Philadelphia: J. B. Lippincott Company, 1944.

This is a comprehensive and authoritative book on e physiologic basis and technics of inhalational erapy. The author is particularly well qualified to rite such a book by virtue of his extensive clinical d experimental training in this field. The text is ncise, carefully edited and practical in content and esentation. It is an excellent summary and a careful aluation of the entire field. The material covers the storical and physiologic background of inhalational erapy in all its aspects from the use of gases, positive essure and respirators and the equalizing of chest essure to the use of vaporized solutions with symthomimetic drugs. The author summarizes the etiogy, pathologic physiology, symptoms and management inhalational therapy of acute anoxia (acute altitude ckness), pulmonary diseases, cardiac and cardiovasular diseases, migraine, seasickness, hemorrhage and any other conditions for which inhalational therapy is value. Besides the material on the use of inhalational erapy for over 30 clinical conditions of general medical terest, there is a discussion of asphyxia of the newrn which should be of special interest to the pediaician and the obstetrician. The book will have a ecial appeal to physicians engaged in military medine, and the sections on injuries of the lungs caused blasts, aerial transportation of patients with misellaneous diseases, poisoning by oxygen and war gases, bmarine medicine and caisson disease are of specialed interest. The chapter on research aspects of therapy means of the respiratory functions is both instructive d provocative and summarizes the present and future ate of the therapeutic use of gases in clinical medicine. here are five excellent and practical chapters devoted methods and technics for using apparatus intended r the administration of the various types of gas. This scussion covers tents, catheters, masks, respirators d incubators. The last chapter is devoted to the dermination of the concentration of oxygen and of rbon dioxide in inspired air in masks and in other quipment used in therapy by means of oxygen.

The book not only is one of the most comprehensive d yet concise collections of critically evaluated current ata on inhalational therapy but serves as a practical uide to persons charged with operating equipment used in this type of treatment. The text is well documented, with a selected and up-to-date bibliography and 59 clear and explicit illustrations. The book deserves a place in the library of every practicing physician and will be especially useful to nurses and technicians to provide a rational background for the use of inhalational equipment. Anesthetists and students of anesthesiology will find this an authoritative contribution in their field.

Handbook of Nutrition. By Many Contributors. Price, $2.50. Pp. 586. Chicago: American Medical Association, 1943.

The "Handbook of Nutrition" is a symposium on nutrition written for physicians and for all others who are interested in the field of nutrition. Each article is contributed by an authority in his particular field. The keynote of the book is the role of nutrition in the advance of the human race. The purpose of the book is to amplify the knowledge of nutrition. Stiebeling says in her chapter on American diets: "As far as the immediate or long term well-being of a person can be improved through dietary betterment, that person falls short of being truly well fed."

The first chapters deal with constituents of food—proteins, fats, minerals and vitamins; calories; the human requirement; the role of the various nutritional elements in metabolism, and their incorporation into the daily food intake.

There follows a discussion of the changes in the composition of foods, especially in their vitamin and mineral content, which may be brought about by processing—that is, by storage, freezing, canning and dehydrating. The need for limiting the reductions in food value that take place as a result of processing is clearly demonstrated.

Next, consideration is given to the improvement of the common foods (for example, the enrichment of flour) for the purpose of providing the essentials of nutrition more adequately to every one. Some factors in the problem of providing adequate nutrition to all are income level, size of family and home management.

The last chapters are devoted to present day methods of appraisal of the state of nutrition, deficiency diseases and their prevention and the use of diet in the treatment of disease.

This book presents a complete nutritional study and is one which every physician and every other person interested in nutrition will wish to own.

News and Comment

PERSONAL NEWS

New Appointments for Dr. L. Emmett Holt Jr. and Dr. James L. Wilson.—Dr. L. Emmett Holt Jr., associate professor of pediatrics at Johns Hopkins Medical School, has been appointed professor of pediatrics at the New York University College of Medicine and director of pediatrics service at Bellevue Hospital.

Dr. James L. Wilson, who previously held this position, has accepted the chair of pediatrics at the University of Michigan.

Directory of Pediatric Societies *

INTERNATIONAL

International Association of Preventive Pediatrics

President: Prof. S. Monrad, Dronning Louises Børnehospital, Copenhagen, Denmark.
Secretary: Dr. Daniel Oltramare, 15 Rue Lévrier, Geneva, Switzerland.

International Congress of Pediatrics

President: Dr. Henry F. Helmholz, Mayo Clinic, Rochester, Minn.
Secretary-Treasurer: Dr. Charles F. McKhann, University Hospital, Ann Arbor, Mich.
Canadian Committee:
Chairman: Dr. Alan Brown, Hospital for Sick Children, 67 College St., Toronto.
Secretary: Dr. H. P. Wright, 1509 Sherbrooke St. W., Montreal.
Place: Boston. Time: Postponed indefinitely.

International Congress for the Protection of Infancy

Secretary: Prof. G. B. Allaria, Corso Bramante 29, Torino 120, Italy.

FOREIGN

Argentine Pediatric Society of Buenos Aires

President: Dr. Martin Ramón Arana, 1809 Rodriguez Peña, Buenos Aires.
General Secretary: Dr. Alfredo Larguia, Cerrito 1179, Buenos Aires.

Associação Paulista de Medicina, Section on Pediatrics

President: Dr. Vicente Lara.
First Secretary: Dr. Armando de Arruda Sampaio.
Second Secretary: Dr. Paulo de Barros Franca, Av. Brigadeiro Luiz Antonio 393, 1° Andar, São Paulo, Brazil.

British Paediatric Association

President: Prof. L. G. Parsons, 58 Calthorpe Rd., Five Ways, Birmingham.
Secretary: Dr. Donald Paterson, 27 Devonshire Pl., London, W. 1.

Danish Pediatric Society

President: Dr. E. Lenstrup, Copenhagen.
Secretary: Dr. E. Gjørup, Dronning Louises Børnehospital, Copenhagen.

Nederlandische Vereeniging voor Kindergeneeskunde

President: Dr. J. H. G. Carstens, Servaasbolwerk 14ª, Utrecht.
Secretary: Dr. R. P. van de Kasteele, Laan van Poot 340, 's Gravenhage.
Place: Different places. Time: Three times a year.

Paediatrický Spolok na Slovensku

President: Dr. A. J. C. Chura, Lazaretská 11, Bratislava.
Secretary: Dr. P. Rados, Lazaretská 6, Bratislava.
Place: Pediatric Clinic, University Bratislava. Time: Six times a year.

Royal Society of Medicine, Section for the Study of Disease in Children

President: Dr. E. A. Cockayne, 98 Harley St., London W. 1, England.
Secretary: Dr. R. Lightwood, 86 Brook St., London W. 1, England.
Place: 1 Wimpole St., London. Time: Fourth Friday of each month, 4:15 p. m.

Palestine Jewish Medical Association, Section of Physicians of Children's Diseases

President: Prof. S. Rosenbaum, 26 Bialkstr., Tel Aviv
Secretary: Dr. A. Brünn, 9 Maazestre, Tel Aviv.

Sociedad Cubana de Pediatria

President: Dr. Angel A. Aballí Arellano, 17 No. 6[illegible] Vedado, Habana.
Secretary: Dr. Julio G. Cabrera Calderin, Hospital Mercedes L y 21 (Vedado), Box 2430, Habana.
Place: Cátedra de Clinica Infantil, Hospital Mercedes Habana. Time: Last Wednesday of every month.

Sociedad Mexicana de Pediatria

President: Dr. Fernando López Clares, 12/a. Medellí 191, Mexico.
Secretary: Dr. Jesus Gómez Pagola, Versalles 6[illegible] Mexico.

Sociedad Venezolana de Puericultura y Pediatr[illegible]

President: Dr. E. Santos Mendoza.
Secretary: Dr. P. Oropeza, Hospital de Niños, Caraca[illegible]

Société de Pédiatrie de Paris

President: Dr. B. Weill-Hallé, 49 Avenue Raymon Poincare, Paris, France.
Secretary: Dr. Jean Hallé, 10 bis Rue Pré aux Cler Paris, France.
Place: Hôpital des Enfants Malades, 49 Rue de Sèvr Time: 4:30 p. m., third Thursday of every month.

Uruguyan Society of Pediatrics

President: Dr. Jose Alberto Praderi, Eduardo Acevel 1132, Montevideo.
Secretary: Dr. Alfredo Ramon Guerra, Paysandú 8[illegible] Montevideo.

NATIONAL

American Medical Association, Scientific Assembly, Section on Pediatrics

Chairman: Dr. John Aikman, 184 Alexander S[illegible] Rochester, N. Y.
Secretary: Dr. Gilbert J. Levy, 188 S. Bellevue Blvd Memphis, Tenn.
Place: Philadelphia. Time: June 18-22, 1945.

American Academy of Pediatrics

President: Dr. Franklin P. Gengenbach, 1850 Gilp St., Denver, Colo.
Secretary: Dr. Clifford G. Grulee, 636 Church S[illegible] Evanston, Ill.

* Secretaries of societies are requested to furnish the information necessary to make this list complete and to keep it up to date.

American Hospital Association, Children's Hospital Section

hairman: Dr. Joelle C. Hiebert, 299 Main St., Lewiston, Maine.
ecretary: Dr. W. Franklin Wood, McLean Hospital, Waverly, Mass.

American Pediatric Society

resident: Dr. James L. Gamble, 300 Longwood Ave., Boston.
ecretary-Treasurer: Dr. Hugh McCulloch, 325 N. Euclid Ave., St. Louis.

Canadian Society for the Study of Diseases of Children

resident: Dr. R. R. Struthers, 906 Drummond Medical Bldg., Montreal.
ecretary-Treasurer: Dr. Elizabeth Chant Robertson, Hospital for Sick Children, Toronto.

Society for Pediatric Research

resident: Dr. Edward M. Bridge, 219 Bryant St., Buffalo, N. Y.
ecretary: Dr. Mitchell I. Rubin, 1740 Bainbridge St., Philadelphia 46.

SECTIONAL

Intermountain Pediatric Society

resident: Dr. Eugene Smith, 385–24th St., Ogden, Utah.
ecretary-Treasurer: Dr. W. C. Cheney, 837 Boston Bldg., Salt Lake City.
lace: Salt Lake City General Hospital. Time: First Thursday of each month, 8 p. m.

New England Pediatric Society

resident: Dr. Warren R. Sisson, 319 Longwood Ave., Boston.
ecretary-Treasurer: Dr. James Marvin Baty, 1101 Beacon St., Brookline, Mass.
lace: Boston Medical Library. Time: Four meetings a year, occurring from September to May.

North Pacific Pediatric Society

resident: Dr. M. L. Bridgeman, 1020 S. W. Taylor St., Portland, Ore.
ecretary: Dr. C. G. Ashley, 833 S. W. 11th Ave., Portland, Ore.

Northwestern Pediatric Society

resident: Dr. Arild E. Hansen, University of Minnesota, Minneapolis.
ecretary-Treasurer: Dr. Albert V. Stoesser, 205 W. University Hospital, Minneapolis.
lace: Minneapolis, St. Paul, Duluth and Rochester. Time: January, April, July and October.

Rocky Mountain Pediatric Society

resident: Dr. G. R. Fisher, 23 E. Pikes Peak Ave., Colorado Springs, Colo.
ecretary: Dr. Joseph H. Lyday, 1850 Gilpin St., Denver.

Southern Medical Association, Section of Pediatrics

hairman: Dr. William Weston Jr., 1428 Lady St., Columbia, S. C.
ecretary. Dr. Angus McBryde 604 W. Chapel Hill St., Durham, N. C.

STATE

Alabama Pediatric Society

President: Dr. Amas Gipson, 948 Forrest Ave., Gadsen.
Secretary-Treasurer: Dr. Ruth Berrey, 2021–6th Ave. N., Birmingham.

Arizona Pediatric Society

President: Dr. Vivian Tappan, San Clemente, Tucson.
Secretary: Dr. Hilda Kroeger, Arizona State Health Dept. (Maternal and Child Welfare Division), Phoenix.

Arkansas State Pediatric Association

Chairman: Dr. C. B. Billingsley, 1425 N. 11th St., Fort Smith.
Secretary: Dr. R. E. Weddington, 1425 N. 11th St., Fort Smith.

California State Medical Society, Section on Pediatrics

Chairman: Dr. William C. Deamer, University of California Hospital, San Francisco.
Secretary: Dr. Charles W. Leach, 2000 Van Ness Ave., San Francisco.

Florida State Pediatric Society

President: Dr. Ludo Von Meysenbug, Box 3356, Daytona Beach.
Secretary: Dr. Robert Blessing, 409 Blount Bldg., Ft. Lauderdale.
Place: Concurrent with state association meeting at time of convention.

Georgia Pediatric Society

President: Dr. T. F. Davenport, 104 Ponce de Leon Ave. N. E., Atlanta.
Secretary-Treasurer: Dr. Don F. Cathcart, 478 Peachtree St. N. E., Atlanta.

Hezekiah Beardsley Pediatric Club of Connecticut

President: Dr. Edward T. Wakeman, 129 Whitney Ave., New Haven.
Secretary: Dr. Herman Yannet, Southbury Training School, Southbury.
Time: Three meetings a year.

Illinois State Medical Society, Section on Pediatrics

Chairman: Dr. Craig D. Butler, 715 Lake St., Oak Park.
Secretary: Dr. A. J. Fletcher, 139 N. Vermilion, Danville.

Indiana State Pediatric Society

President: Dr. K. T. Knode, 1105 E. Jefferson Bldg., South Bend.
Secretary-Treasurer: Dr. Mathew Winters, 621 Hume Mansur Bldg., Indianapolis.
Time: Two meetings a year.

Iowa Pediatric Society

President: Dr. Mark L. Floyd, Children's Hospital, Iowa City.
Secretary-Treasurer: Dr. James Dunn, Davenport Bank Bldg., Davenport.

MEDICAL SOCIETY OF STATE OF NEW YORK, SECTION ON PEDIATRICS

Chairman: Dr. A. Clement Silverman, 608 E. Genesee St., Syracuse.
Secretary: Dr. Albert G. Davis, 307 Gas and Electric Bldg., Utica.

MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA, PEDIATRIC SECTION

Chairman: Dr. Elwood W. Stitzel, 403 Central Trust Bldg., Altoona, Pa.
Secretary: Dr. P. F. Lucchesi, Philadelphia Hospital, Philadelphia.

MICHIGAN STATE MEDICAL SOCIETY, PEDIATRIC SECTION

Chairman: Dr. Charles F. McKhann, University Hospital, Ann Arbor.
Secretary: Dr. Mark F. Osterlin, Central Michigan Children's Clinic, Traverse City.

MISSISSIPPI STATE PEDIATRIC SOCIETY

President: Dr. Harvey F. Garrison Jr., 315 E. Capitol Pl., Jackson.
Secretary: Dr. Guy Verner, 126 N. Congress St., Jackson.

NEBRASKA PEDIATRIC SOCIETY

President: Dr. E. W. Hancock, 820 Sharp Bldg., Lincoln.
Secretary-Treasurer: Dr. John M. Thomas, 1102 Medical Arts Bldg., Omaha.
Place: As announced by committee. Time: Third Thursday of each month from October to June, inclusive. Dinner at 6 p. m.

NEW HAMPSHIRE PEDIATRIC SOCIETY

President: Dr. MacLean J. Gill, 14 N. State St., Concord.
Secretary-Treasurer: Dr. Ursula G. Sanders, 46 Pleasant St., Concord.
Time: Twice yearly.

NORTH CAROLINA PEDIATRIC SOCIETY

President: Dr. Arthur H. London, 1105 W. Main St., Durham.
Secretary: Dr. Jay M. Arena, 604 W. Chapel Hill St., Durham.

OKLAHOMA STATE PEDIATRIC SOCIETY

President: Dr. Ben H. Nicholson, 301 N. W. 12th St., Oklahoma City.
Secretary: Dr. Luvern Hays, 108 W. 6th St., Tulsa.
Place: Oklahoma Club. Time: 6:30 p. m., fourth Friday of each alternate month from September to May, inclusive.

SOUTH CAROLINA PEDIATRIC SOCIETY

President: Dr. Lonita Boggs, 301 E. Coffee St., Greenville.
Secretary-Treasurer: Dr. Hilla Sheriff, Wade Hampton Office Bldg., Columbia.

TEXAS PEDIATRIC SOCIETY

President: Dr. F. H. Lancaster, 4409 Fannin St., Houston.
Secretary-Treasurer: Dr. John E. Ashby, 3610 Fairmount Ave., Dallas.

VIRGINIA PEDIATRIC SOCIETY

President: Dr. Edwin A. Harper, 301 Rivermont Ave., Lynchburg.
Secretary: Dr. Emily Gardner, 1100 W. Franklin St., Richmond.

WEST VIRGINIA STATE MEDICAL SOCIETY, SECTION ON PEDIATRICS

President: Dr. Andrew Amick, 1021 Quarrier St., Charleston.
Secretary: Dr. A. A. Shawkey, Professional Bldg., Charleston.

LOCAL

ACADEMY OF MEDICINE OF CLEVELAND PEDIATRIC SECTION

Chairman: Dr. J. D. Nourse, 10515 Carnegie Ave., Cleveland.
Secretary: Dr. I. B. Silber, 10465 Carnegie Ave., Cleveland.
Place: Cleveland Medical Library Bldg. Time: October, December, February and April.

ACADEMY OF MEDICINE, TORONTO, SECTION OF PEDIATRICS

President: Dr. I. Nelles Silverthorne, 170 St. George St., Toronto, Canada.
Secretary: Dr. G. P. Hamblin, 2333 Bloor St. W., Toronto, Canada.

BRONX PEDIATRIC SOCIETY

President: Dr. Harry J. Cohen, 1975 Walton Ave., New York.
Secretary: Dr. Walter Levy, 12 E. 88th St., New York.
Place: Concourse Plaza Hotel, 161st St., and Grand Concourse. Time: Second Wednesday of each month except June, July, August and September.

BROOKLYN ACADEMY OF PEDIATRICS

President: Dr. Harry A. Naumer, 37–8th Ave., Brooklyn.
Secretary: Dr. Lewis A. Koch, 62 Pierrepont St., Brooklyn.
Place: Granada Hotel. Time: Fourth Wednesday of October, November, February, March and April.

BUFFALO PEDIATRIC SOCIETY

President: Dr. A. Wilmot Jacobsen, 187 Bryant St., Buffalo N. Y.
Secretary: Dr. Richard A. Downey, 786 Forest Ave., Buffalo, N. Y.
Place: Children's Hospital, 219 Bryant St. Time: 8:30 p. m., first Monday of each month from September to June.

CENTRAL NEW YORK PEDIATRIC CLUB

President: Dr. Edward J. Wynkoop, 501 James St., Syracuse.
Secretary: Dr. Frank J. Williams, 58 S. Swan St., Albany.
Places:: Various cities in New York. Time: Third Tuesday of April and September.

CHICAGO PEDIATRIC SOCIETY

President: Dr. Morley D. McNeal, 2 N. Sheridan Rd., Highland Park, Ill.
Secretary: Dr. Henry G. Poncher, 1819 W. Polk St., Chicago.
Place: Children's Memorial Hospital, 710 Fullerton Ave. Time: Third Tuesday of each month, October to May, Inclusive.

Cincinnati Pediatric Society

retary: Dr. T. Selkirk, 3530 Reading Rd., Cincinnati.
ce: Children's Hospital, Elland Ave., Cincinnati.
ime: On call.

sident: Dr. Lloyd K. Felter, 3144 Jefferson Ave., Cincinnati.

Dallas Pediatric Society

sident: Dr. John E. Ashby, 3610 Fairmount Ave., Dallas, Texas.
retary-Treasurer: Dr. Gladys J. Fashena, 4585 Bel-ort, Dallas, Texas.
ce: Bradford Baby Hospital. Time: 1 p. m., second nd fourth Saturdays of each month.

Detroit Pediatric Society

sident: Dr. John J. Pollack, 650 Maccabees Bldg., Detroit, Mich.
retary: Dr. Philip J. Howard, 2799 W. Grand Blvd., Detroit, Mich.
ce: Wayne County Medical Society. Time: 8:30 . m., first Wednesday of each month from October o June, inclusive.

Fulton County Medical Society, Pediatrics Section (Atlanta, Ga.)

irman: Dr. Don F. Cathcart, 478 Peachtree St. N. E., Atlanta.
retary: Dr. Harry Lange, 478 Peachtree St., N. E., tlanta.
ce: Academy of Medicine, 38 Prescott St. N. E. ime: Second Thursday of each month from October o April, 8 p. m.

Houston Pediatric Society

sident: Dr. Raymond Cohen, 2300 Caroline St., Houston, Texas.
retary: Dr. Betty Moody, 526 Richmond Rd., Houston, Texas.
ce: College Inn, Houston. Time: Fourth Monday f each month.

Kansas City (Missouri) Pediatric Society

sident: Dr. Edwin H. Schorer, 1103 Grand Ave., Kansas City.
retary: Dr. H. E. Petersen, Kirkpatrick Bldg., St. oseph, Mo.
ce: Kansas City General Hospital. Time: On call.

Los Angeles County Medical Association, Pediatric Section

sident: Dr. Oscar Reiss, 2200 W. 3d St., Los Angeles.
retary-Treasurer: Dr. Elena Boder, 1830½ Lucille Ave., Los Angeles.
ce: Los Angeles County Medical Headquarters, 1925 Wilshire Blvd. Time: Second Monday of February, April, June, October and December.

Medical Society of the County of Kings and the Academy of Medicine of Brooklyn, Pediatric Section

sident: Dr. Abraham M. Litvak, 1145 Eastern Park-way, Brooklyn.
retary: Dr. Harold Levy, 750 St. Marks Ave., Brooklyn.
ce: 1313 Bedford Ave., Brooklyn. Time: 9:00 p. m., ourth Monday of each month, October to April, nclusive.

Medical Society of the County of Queens, Inc., Section on Pediatrics

Chairman: Dr. Meyeron Coe, 217-02-91st Ave., Queens Village, N. Y.
Secretary-Treasurer: Dr. Edith A. Mittell, 144-38th Ave., Flushing, N. Y.
Place: Queens County Medical Bldg., Forest Hills, N. Y. Time: Third Monday of October, January, March and May.

Medical Society of the District of Columbia, Section on Pediatrics

President: Dr. Harry A. Spigel, 2647 Connecticut Ave., Washington, D. C.
Secretary-Treasurer: Dr. Perry W. Gard, 2520 Woodley Rd., Washington, D. C.
Place: Medical Society Bldg., 1718 M St. N. W. Time: 8 p. m., fourth Thursday of every month.

Memphis Pediatric Society

President: Dr. F. T. Mitchell, 376 S. Bellevue Ave., Memphis, Tenn.
Secretary-Treasurer: Dr. Harry Jacobson, 1193 Madison Ave., Memphis, Tenn.
Place: John Gaston Hospital. Time: Quarterly.

Milwaukee Pediatric Society

President: Dr. B. J. Malnekoff, 3213 N. Marietta Ave., Milwaukee.
Secretary-Treasurer: Dr. R. M. Hall, 324 E. Wisconsin Ave., Milwaukee.
Place: Milwaukee Athletic Club. Time: Second Wednesday of each alternate month, beginning with February.

New York Academy of Medicine, Section of Pediatrics

Chairman: Dr. Howard Craig, 175 E. 79th St., New York.
Secretary: Dr. Alfred E. Fischer, 73 E. 90th St., New York.
Place: New York Academy of Medicine, 2 E. 103d St. Time: Second Thursday of each month from October to May, inclusive, 8:30 p. m.

Northern California Affiliates

President: Dr. Crawford Bost, 400 Post St., San Francisco.
Secretary: Dr. William A. Reilly, 384 Post St., San Francisco.
Time: Second Thursday of September, November, January, March and May.

Oklahoma City Pediatric Society

President: Dr. William M. Taylor, 1200 N. Walker St., Oklahoma City.
Secretary: Dr. G. R. Felts, 625 N. W. 10th St., Oklahoma City.
Place: Oklahoma Club. Time: Third Thursday of each month.

Philadelphia Pediatric Society

President: Dr. Carl Fischer, Greene and Coulter Sts., Germantown, Philadelphia.
Secretary: Dr. Sherman Little, 1740 Bainbridge St., Philadelphia.
Place: College of Physicians, 19 S. 22d St. Time: Second Tuesday in January, March, May and November.

Pittsburgh Pediatric Society

President: Dr. John D. Sturgeon Jr., 22 N. Gallatin Ave., Uniontown, Pa.

Secretary-Treasurer: Dr. C. J. Stoecklein, Medical Arts Bldg., Pittsburgh.

Place: Pittsburgh Academy of Medicine. Time: Second Friday, alternate month from October to June, inclusive.

Richmond Pediatric Society

President: Dr. Stanley Meade, 913 Floyd Ave., Richmond, Va.

Secretary-Treasurer: Dr. Louise Galvin, 214 S. Boulevard, Richmond, Va.

Place: Richmond Academy of Medicine, 1200 E. Clay St. Time: 8 p. m., third Thursday of each month, except June, July and August.

Rochester Pediatric Society

President: Dr. Herbert Soule, 122 Rutgers St., Rochester, N. Y.

Secretary-Treasurer: Dr. Jerome Glaser, 300 S. Goodman St., Rochester, N. Y.

Place: Rochester Academy of Medicine or arrangement by program committee. Time: Third Friday of each month from October to May.

St. Louis Pediatric Society

President: Dr. Jerome Diamond, 508 N. Grand Ave., St. Louis.

Secretary-Treasurer: Dr. Mary A. McLoon, 408 Humboldt Bldg., St. Louis.

Place: St. Louis Medical Society Bldg. Time: First Friday of each month from November to June.

Seattle Pediatric Society

President: Dr. Frederick B. Joy, Stimson Bldg., Se
Secretary: Dr. Sherod M. Billington, Medical D
Bldg., Seattle.

Place: College Club. Time: Third Friday of
month from September to June at 6:30 p. m.

Southwestern Pediatric Society

President: Dr. Jeanette Harrison, 1136 W. 6th
Los Angeles.

Secretary: Dr. Henry F. Gallagher, 1930 Wil
Blvd., Los Angeles.

Place: Jonathan Club of Los Angeles. Time:
Wednesday in January, March, May, September
November.

University of Michigan Pediatric and Infectious Disease Society

President: Dr. Campbell Harvey, 35 W. Huron
Pontiac, Mich.

Secretary: Dr. Harry A. Towsley, University of M
igan, Department of Pediatrics and Communic
Diseases, Ann Arbor, Mich.

Westchester County Medical Society, Pediatric Section (New York)

President: Dr. John B. Ahouse, 27 Ludlow St., Yonk
N. Y.

Secretary-Treasurer: Dr. Elvira Ostlund, 64 High
Rd., Rye, N. Y.

Place: Grasslands Hospital, Valhalla, N. Y. T
Third Thursday in October, December, February
April.